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EDUCATIONAL NEWS AND EDITORIAL COMMENT

War Savings Stamps

The Treasury Department of the United States has organized a plan for gathering up the small savings of the nation. The plan is a war measure, but its influence will doubtless reach far beyond the period of the war. The plan is described by those who have it in charge as a thrift campaign.

For many years foreign governments, especially the French government, have made it possible for their people to deposit their savings with the government by purchasing government certificates of small denomination. In this country the government has issued its bonds only in large denominations.

The Liberty Loans were sold in fairly small denominations because it was recognized that the vast sums of money needed for the war must not be drawn out of business, where it is needed to keep industry going, but must be obtained through the savings of the people.

Now come the War Savings Stamps. These are for small savings. The hope is that in the aggregate they will bring to the Treasury two billions of dollars. The stamps can be purchased at any post-office and at hundreds of other agencies which have been set up in stores and schools. The Thrift Stamps cost twenty-five

cents apiece. When sixteen have seen secured they can be converted by a small additional payment into War Savings Stamps. After five years the War Savings Stamps mature. At maturity they pay 4 per cent interest compounded quarterly. In the interval they can be cashed at any post-office and will pay somewhat over 3 per cent interest.

Teachers have an opportunity to render a service to the country and also to the children by calling attention to these stamps. The government needs to secure an average of twenty dollars each from every man, woman, and child in the United States if this loan is to be a complete success. Every purchase of a twenty-five-cent stamp will help to win the war.

The following letter has been addressed by the Committee on Public Information, Washington, D.C., to school officers throughout the United States:

Information on the War

The Committee on Public Information has issued and will issue during the coming year a series of booklets bearing upon the War and America's part in it.

In co-operation with the Commissioner of Education, we are planning to place in the hands of every school teacher throughout the United States copies of these publications.

This is the first step of a campaign to secure the aid of the educational forces of the country in the promotion of a clear and intelligent understanding of the War. Your co-operation will be one of the principal features in making this a success.

The publications of the Committee should be in the hands of teachers. There is information in these publications about the organization of the Army and the Navy, about the statements of foreign governments and their policies, about our Congress and the laws which it has passed. In short, there is information on the topics on which every patriotic citizen, and especially teachers, should be intelligent.

The publications are being distributed with the aid of the Commissioner of Education. If teachers do not receive copies, they should write to the Committee in Washington.

Schools and Coal

Schools have had a serious time during the past few weeks. Along with the industries of the country they have been closed because of lack of coal or for the purpose of conserving the supply.

There is one point which it is worth while to make with emphasis. The essential industries were allowed to keep open. The schools should be classified with the essential industries. It is not a trivial matter to the home or to the community that schools should be closed, and certainly the school is not to be treated as in any sense a nonessential.

The case is somewhat different where schools were closed because of shortage rather than as a measure of conservation of the supply. In such cases it is not too much to ask that the loss be made good in the warm weather.

The experience of England and Canada and France is unequivocal in this matter. Schools must be kept open. Where this is not done juvenile delinquency increases and in the long run the country pays more than it saves.

Every agency which has to do with the welfare of children in this country must be alert to see that the necessity of keeping schools going even in the face of difficulties is held clearly before the American people. It is fatally easy to give up one week of school and then another without foresight for the evil consequences which follow. The children and the teachers are distracted by such interruptions. The course of study breaks down and the pupils get a false view of the seriousness and importance of what they are doing. School officers should make it their business to see that the war does not abridge educational opportunities.

Lack of Teachers

From various parts of the country comes the report that the supply of teachers is inadequate. One normal school received a telegram some days ago from a neighboring county superintendent saying, "Send six teachers at once. No questions asked." The form of this message suggests that keeping school rather than educating the children may be accepted as the full duty of a district during these strenuous times.

Another line of action which it may be wise to consider on a large scale is the employment of married women, especially those who in the earlier years of their lives have had some experience in teaching. The original school of Pestalozzi was a school conducted by an intelligent mother. The country can properly look on any school as a co-operative method of bringing up its children. Why not put together all these lines of thought and set up a co-operative school where some intelligent mother in the community helps all by the service she can render?

The difficulties, of course, will affect first the rural schools, and gradually the small towns and cities will feel the effects. School committees will have to face the fact that they must enter into competition for the retaining of such teachers as there are or they will have to devise some such new supply as is suggested in the last paragraph.

The economic problem of conducting schools will become an increasingly urgent one as the war goes on. It has been suggested that our states help meet the problem by paying normal-school students and in this way recruiting the profession. It is interesting to note that England tried that experiment for years before the war with indifferent success.

The teaching profession is more likely to be made attractive by the development of more permanent and satisfactory conditions in teaching positions. The salaries should be improved. At the same time methods of evaluating services should be devised which guarantee the protection of a teacher and also guarantee to a community the best grade of services which can be secured.

This time when the scarcity of teachers is a very real fact calls for educational statesmanship of a high order. The scarcity should not be made into an opportunity merely for pushing up salaries indiscriminately. The scarcity should be met, as we are these days trying to meet every emergency, with a spirit of willingness to go to the bottom of the whole matter and build a strong foundation. Let us find out how the teaching profession ought to grow and then put forth vigorous efforts to do the right thing at this time when something must be done.

School Libraries

The editors of the periodical entitled *Public Libraries*, published by the Library Bureau, Chicago, announce that the February issue will be devoted to the discussion of school libraries. This *Journal* has been asked to call the special attention of teachers to this fact and is entirely willing to comply with that request.

The description which accompanies the request indicates that most of the articles are to be written by those who are engaged in conducting high-school libraries rather than elementary-school libraries. Perhaps this is due to the fact that elementary schools in the past have been backward in the development of library facilities. The time has come, however, when every elementary school should have many books other than the textbooks used in class work. Teachers should interest themselves in the methods of selecting and classifying books. Every school should give instruction in the use of a library card catalogue. Pupils who go out of the grades will be prepared in this way to look up information in public libraries. The school will gain also by opening up to pupils a great deal of material related to the course of study which would otherwise not be accessible.

This *Journal* is therefore very glad to give its strongest support to any agency which will promote the development of school libraries and recommends the February issue of *Public Libraries* to the attention of school officers.

If a school cannot have a large collection of books, that should not be accepted as a reason for not having any. Even a small collection, well classified, will do much to train pupils. There is no school which cannot do something in this direction, perhaps with the aid of a parents' association.

Foreign Languages

The following statement regarding the teaching of foreign languages in the elementary schools is issued by the Bureau of Education:

> Only 19 cities out of 163 of 25,000 population or over reporting to the Bureau of Education teach foreign languages below the seventh grade of the elementary school, according to a statement

just made public. In 12 of these cities German is the foreign language taught; in three cities German, French, and Spanish are all taught in the elementary grades; in one city German, Italian, and Polish; while in the three remaining cities the languages taught to elementary-school children are French and Spanish, alone or in combination. In a few cities the foreign language is taught in all grades, from the first to the eighth; in others the instruction does not begin until the fifth or sixth grade. The number of elementary-school children taking German ranges from 40 in one city to 22,000 in another.

Few of the superintendents who replied to the Bureau's inquiry favor the teaching of German or any other foreign language in the lower elementary school, though many of them believe thoroughly in foreign-language study for students in higher schools. A California superintendent says: "I was in doubt before the war. I am becoming convinced now that our public schools should teach 'one nation, one language, one flag.' The teaching of a foreign language below the seventh grade is a sentimental hold of the old country on Americans of the second generation." An Illinois superintendent says: "The public schools should not assist in perpetuating a foreign language in the home and foreign viewpoints in the community." An Iowa superintendent is careful to explain that German is taught in the elementary grades in his schools because "German-American grandparents and many parents demand it."

A typical condition is that in Baltimore, Maryland, where the introduction of German as a subject of instruction in elementary schools in 1874 was partly due to the fact that there were a large number of German private schools in which the atmosphere was entirely German. By the introduction of German into the public schools the private schools were eliminated, and the children gradually came under the influence of American ideas. In this city the superintendent reports that "the number of pupils taking German has been reduced so that now German is taught only in a few instances in the seventh and eighth grades." In St. Louis instruction in German in the elementary schools was discontinued in the eighties. In Cincinnati agitation against the continuation of German in the schools has resulted in the reduction of the number of children studying German in the grades from 13,800 in 1916–17 to 7,000 in 1917–18. German has been taught in all grades of the elementary schools of Cincinnati for seventy-six years.

In its statement regarding the situation the Bureau makes the following suggestions: "There is general agreement among educators and public men, both in this country and abroad, that there should be no interference with existing high-school and college provision for the teaching of German; that a knowledge of the German language is more important now than it was before the war. The upper elementary grades, especially where organized in the junior high school, may quite properly offer foreign languages, including German, but educators generally look upon the teaching of foreign languages in the lower elementary grades as of very questionable value."

Conference on the Training of Industrial Teachers

A conference of men engaged in training manual arts and industrial teachers was held at Columbia, Missouri, in December. The conference was called by a representative of the Bureau of Education at Washington and was intended to serve as a clearing house for information covering the general problem of teacher training in this particular field. Fourteen Mississippi Valley states were represented.

The program centered around the following topics: "The Smith-Hughes Act as Related to Teacher Training"; "The Examination and Certification of Manual Arts and Industrial Teachers"; "Provision for Practice Teaching in Connection with Industrial Work"; and "Teacher Training Curricula."

The discussion of the Smith-Hughes act was led by Dr. R. J. Leonard, district agent for the Federal Board for Vocational Education. Dr. Leonard cleared up for the members of the conference many of the perplexing questions which have grown out of the provisions and interpretation of the act. The respective powers of state and federal boards were set forth and typical approved state training programs were presented and discussed. The whole discussion indicated a tendency on the part of both federal and district representatives to adapt the provisions of the act to local and state needs rather than to develop a rigid and uniform system. For this reason initiative is being left to local and state authorities rather than to federal and district representatives.

The interest in and the emphasis being given to the development of the general industrial school for cities of 25,000 or under was the center of considerable discussion. It is through this institution that the Federal Board hopes to extend the benefits of the Smith-Hughes act to the small industrial centers of the Mississippi Valley. The development of such an institution will be an easy step from the best type of technical high school, and its extension should stimulate progressive standards for both the training of teachers and schoolroom practice.

The discussion indicated a disposition on the part of those responsible for the training of industrial teachers to insist upon more exacting professional standards than it has been possible to enforce

in the past. If the general spirit of this meeting is to be taken as an indication of future development in the training of industrial and manual arts teachers, it means a demand for professional standards comparable to those being enforced in other departments.

Meeting of Section L

The meeting of Section L, the education section of the American Association for the Advancement of Science, is coming to be one of the most important occasions of the year for the presentation of scientific studies of school problems. Although the meetings of the Association were this year somewhat interfered with by the war, a large number of scientific papers was presented. The customary address of the retiring vice-president of Section L had to be omitted this year because of the pressing war duties which kept Dr. Leonard P. Ayres of the Council of National Defense away from the meeting.

The papers presented at the meeting may be grouped into three classes. In the first place, the methods of scientific measurement were themselves subjected to critical examination. Dr. W. A. McCall subjected a piece of work which he had done at an earlier date to a scientific examination in order to find out the reliability of the earlier work. His interesting title was "The Reliability of a Ph.D. Dissertation." A second paper of this class was one by Dr. F. S. Breed, reporting the results of a comparative study of two methods of measuring the understanding of sentences. Dr. Breed showed that reproductions of passages read and answers to questions do not prove to be like methods of measuring the understanding of passages read. The importance of this conclusion is that the scientific student of education must choose his methods of investigation with critical care.

A second group of studies attempted to define more accurately than has hitherto been done the measurable elements in several of the elementary-school subjects. This type of investigation was well illustrated by a number of reports on reading: "Elements in Reading Abilities," by Daniel Starch; "Reading Ability as a Phase of Study Ability," by H. A. Brown; "Diagnosis of Reading Ability," by C. T. Gray. The papers showed that rapid progress

has been made in scientific analysis and a clear definition of the measurable elements in several school subjects.

A third group of studies reported applications made of scientific methods to the selection of appropriate material for the course of study. The following titles give some idea of the type of applications discussed: "Application of the Range of Information Test to the Course in Physiology," by N. M. Grier; "The Content of Courses Dealing with Plant and Animal Life in the Public Schools," by E. R. Downing.

Inasmuch as the American Psychological Association met in joint session with Section L, a number of the reports related primarily to problems in the field of educational psychology. The following titles are typical of the reports of this type: "Estimation of Apperceptive Abilities," by A. F. Bromer; "Part versus Whole Methods in Learning Nonsense Materials," by A. F. Pechstein.

THE COURSE IN NATURAL SCIENCE IN THE UNIVERSITY ELEMENTARY SCHOOL. I

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Introductory statement.—Natural-science instruction in one form or another is given throughout the University Elementary and High schools. In all the grades all pupils have elementary science. In the first year of the high school almost all pupils have general science, the only exceptions being those pupils who have two foreign languages in their first-year course. Following the first year of the high school the work in the special sciences is elective.

General aims.—The work aims to utilize, extend, and develop the pupils' interests; to arouse new interests; to establish a fund of concrete experiences which are experimented with and discussed sufficiently to make them intelligently usable; to develop the habit of recognizing the problems which nature presents, and of trying to discover the explanatory reasons which are involved in such problems; to present to the pupils the types of materials and types of thinking which are involved in some of the divisions of science, and to give an elementary understanding by means of which they may appreciate the significance of some of the contributions which science has made to human welfare; above all the work is designed to stimulate the pupils to use science in their thinking and constructive work and to lead them to a measure of independence as they develop in their powers of observation, discrimination, and interpretation.

General methods.—In method, throughout the University Elementary and High schools, considerations of science are constantly based upon concrete experiences recalled from out-of-school life

or set forth in schoolroom demonstrations or experiments. Science must be concrete, not abstract, in order to be real to young students. The situations in life which make science study most important are usually very real and very concrete. Concrete studies are likely to become dynamic; abstract studies are in danger of becoming static. As pupils advance through the grades into the high school the same method of work is continued, but the proportionate amount of concrete materials may be reduced, since the ability to recall and use previous experiences and the experiences of others is increased. In dealing with the materials upon which the course is based the pupils are directed to constructive work as far as possible in order that they may develop the ability to use their senses objectively as well as the ability to consider the principles involved in the work which is being done. Topics and materials of practical interest are constantly used, not primarily, however, for a utilitarian end, though it is hoped that some measure of ability to use information, thought, and methods may be developed. Such materials are used because practical matters in science elicit more active interest and independent thought. The things which appeal to the pupils as most worth their consideration are the ones which stimulate their minds most, consequently the ones which are most educative. The science of the school, home community, and city, and of the personal needs of the pupils, both individually and as groups, is the science material which is best calculated to give the greatest and most permanent values in education. It requires science of no less value to solve a practical problem of the home than to solve one of the laboratory. The problem of the laboratory may easily be made to associate itself with the home, community, or needs of the pupils, else the problem should be left aside and supplanted by the one which may develop such associations.

NATURAL-SCIENCE COURSE OF STUDY, THE UNIVERSITY ELEMENTARY SCHOOL

Introductory statement of aims, organizing principles, and standards of attainment.—This course of study in natural science has been organized on the general principle that the interests of the pupil

are constantly changing, and that these interests are increasing from year to year. In the very young pupil these interests are immediate and not prolonged; they are confined to narrow limits, to a small circle surrounding his life, but as mental life develops more remote interests appeal to the pupil.

The work of the lower grades.—The study of nature in the grades serves to rationalize and organize the children's interest in the outdoor world and to awaken new fields of interest. It tends to develop keen observation and thoughtful inquiry. While at best each of these can be realized but imperfectly, yet even this attitude can result only where opportunity for initiative, personal observation, and independent conclusions is provided, so that the very aim of the work necessitates first-hand contacts and out-of-door collection of materials for classroom use.

A young child's interest in nature is less reflective than active and objective. What things are and what he can do with them are his dominant interests. This work therefore employs activities with nature material rather than formal discussions or analyses of such material. In order that the children's motive may be clearly directed to an objective end, the outline for these grades centers itself about given activities.

The interest in basic activities, such as care of pets, making of gardens, etc., is persistent and is carried through the kindergarten and the three succeeding grades. On the other hand it is most necessary that each year shall give varied and enriched material and accomplish specific results. To gain this, detailed suggestions of variation in each activity are made, and particular objects of study are given in each outline, as just what birds, flowers, trees, etc., shall be observed and identified and what pets shall be kept. It would be unfortunate were this division of material interpreted as meaning that materials which come to the grade through transient interest are neglected, or that observation is limited to any prescribed choice of subjects. The division of materials endeavors to sustain normal variety of experience and range of familiarity with nature material.

Repetition of seasonal changes and of pupils' experiences in order to organize the vast variety of material into some coherence

and unity, together with the recurring interests of childhood, make repeated experiences most valuable. To many of us there are memories of repeated seasonal experiences, such as going each spring to the place where the first hypaticas were found, or on the annual autumn quest for nuts, or to the neighboring mill whose machinery entranced us, which experiences by their very repetition gained a charm and meaning quite unique. There is a reminiscent thrill in these experiences which if quite disproportionate to their face value augurs certainly an intimate appeal which was effective in establishing vivid images, individual interests, emotional growth, and significant sense training. It is to insure such experiences for our city-bred children that repeated excursions to the same place occur in the different grades.

In the following outlines for the kindergarten and primary grades the purposes, problems, and materials group themselves about the central activities. This form of organization emphasizes the underlying principle that science knowledge grows out of and is essential to certain childlike activities. There are ten such centers of work chosen for the kindergarten and first grade, and these are repeated and added to in the other primary grades. To follow this plan and see the orderly succession of the work a comparison of each activity throughout these grades is suggested. For example, if viewed through the grades it shows (1) the variety of pets provided, (2) the succession of observations in metamorphosis of moths and butterflies, (3) the increased experience in the care of aquaria, (4) the different types of study of the soil, (5) study of water, evaporation, dew, etc.

The work of the upper grades.—In the upper grades the former interests are kept, but in addition there comes a more intensive interest, a desire to apply some of the knowledge gained to the home and community life and to industrial processes. The graduated course in science as a whole is designed to contribute to the different stages of interest and mental growth.

In the fourth grade a more intensive study of both plant and animal life is introduced because the pupil is more eager now to learn about habits, life-histories, and interrelationships than he was in preceding years. The sense of responsibility and ownership

develops more rapidly at this age; the garden work is planned to foster this through the care of individual plots and the living things in them. He is led to study living things more thoroughly than before, and this intensive study forms better habits of observation and thinking. He learns to prepare aquaria and cages, to care for animals, to make drawings of them. All this widens his vision, quickens his imagination, and aids him in getting acquainted with his environment.

Above the fourth grade the awakening interests of the pupil are best helped in science by a more intensive study of many questions and things of everyday experience. The pupil has reached a higher standard of attainment, as evidenced by his more mature mental processes and his tendencies to more purposeful action. This enables him to undertake experimentally problems which require more prolonged attention. Using his powers in these ways he becomes acquainted with a fund of knowledge about materials, forces, and activities. In the high school and college such knowledge will be classified as physics, chemistry, biology, hygiene, geography, etc., but in the grades such classification is unimportant.

The work of the fifth grade is based partly upon the garden work of preceding years, and carries farther a study of soils and the relation of soils to plant growth. This intensifies the soil study of the fourth-grade geography. Connected with this is an intensive study of one or several plants, such as corn, wheat, and cotton, in which the economic factors are emphasized; or a similar study of certain animals, such as horses, cattle, and sheep. Some of the science problems of this grade concern the processes of making butter, soap, and candles; a few deal with foods; while others treat of physical forces. Thus more interests are awakened or fostered, new habits are formed, and greater skill in manipulation is developed. Also the vision of world-occurrences is widened and a deeper understanding of environmental conditions results.

In the sixth grade a summary of the needs of plants and animals for successful living includes relationships and struggles for life which plants, animals, and man have. Growing out of this is the study of hygiene, both personal and civic. The pupil is able now

to appreciate the importance of his maintaining habits of good health. The wisdom of making laws for promoting good sanitation and the health of the community is also better understood.

To satisfy still further the growing inquisitiveness and eagerness to learn the "how" and "why" of things, the science topics outlined in the latter part of the sixth grade and all of the seventh grade include experimental work in magnetism, electricity, and other physical topics, along with the manifold applications of such work to the home and industrial life.

Investigation of simple problems by experimentation develops that initial scientific attitude of mind which makes the pupil eager to try out things in order to prove or to disprove them. Thus more careful habits of thinking are formed, as is shown by more accurate statements of facts. Increased facility in manipulation shows the formation of other good habits.

The science work endeavors whenever possible to make applications of facts and principles learned, and to correlate the work with other studies, such as geography, history, composition, woodworking, printing, and mathematics. Throughout the grades the written work or sketches of the lower grades and the notebooks of the upper grades correlate the natural science with composition. Also the classroom and library use of selected books in studies of animal life, plant life, garden-making, electrical experiments, and the physics and chemistry of the home correlates the natural science with reading, literature, and history. Likewise much of the construction work demands the use of mathematics.

KINDERGARTEN

OUTLINE OF MATERIALS AND ACTIVITIES

1. Care of pets
   - Canaries
   - Chickens
   - Rabbits
2. Collection of caterpillars and cocoons

   Caterpillars which are brought in are observed making cocoons. Cecropia and polyphemus cocoons are collected and kept through the winter so that the children may observe the appearance of the moth in the spring.

3. Care of aquarium containing goldfish and tadpoles

4. Recognition of the birds most common to the neighborhood and some knowledge of their habits.

   Sparrow
   Robin
   Blue Jay
   Woodpecker

   In this connection the migration and return of the birds is brought out through observation and discussion.

5. Indoor and outdoor gardens

   The children plant bulbs in various ways in the fall. Crocus and tulip bulbs are planted out of doors; hyacinth, jonquil, and narcissus bulbs are planted in window boxes, in jars of pebbles, and in water. The plants in the room are cared for daily by the children. A vegetable and flower garden is prepared, planted, and cultivated by the children. Selection is made from the following: lettuce, radish, pumpkin, beet, nasturtium, bachelor's button, zinnia.

6. Field trips

   The children are taken to a nearby park once in the fall to see the autumn foliage, to gather acorns, and to feed the squirrels. They make frequent visits to the school garden and nearby vacant lots to gather seeds and acorns. In the spring they are taken to Jackson Park to look for birds and to see the rose garden. A trip is made to Washington Park to see the colony of martins and the display of spring flowers at the park conservatory.

7. Through the various activities of the school day the children become acquainted with the following natural objects:

Trees	Weeds	Wild Flowers
Oak	Dandelion	Violet
Poplar	Milkweed	Jack-in-the-pulpit
Maple		Buttercup
Pussy willow		

Garden Flowers	Grains	Vegetables and Fruits
Aster	Corn	Tomato
Marigold	Wheat	Pumpkin
Sweet pea	Oats	Onion
Nasturtium		Beet
Fall chrysanthemum		Carrot
Jonquil		Potato
Narcissus		Pepper

Garden Flowers

Crocus
Hyacinth

Vegetables and Fruits

Orange
Apple
Grape
Banana
Peach
Pear
Plum

Animals

Cow
Horse
Pig
Sheep
Chicken
Turkey
Earthworm
Ladybug
Caterpillar

8. Some of the most striking seasonal changes are brought to the notice of the children, such as the effect of frost on vegetation, the early darkness of the winter afternoons, the longer days in springtime, and the gradual change in the appearance of the out of doors as spring advances.

GRADE I

OUTLINE OF MATERIALS AND ACTIVITIES

1. Care of pets

   A pair of ringdoves. These have sometimes nested and reared young birds in the schoolroom.
2. Observation of cecropia moths
3. Care of an aquarium containing goldfish and tadpoles
4. Study of ways to attract birds to our garden
5. Recognition and study of the most common birds of adjacent parks and gardens: English sparrow, robin, blue jay, red-headed woodpecker, tanager, and grackle.
6. Making indoor and outdoor gardens. In the autumn the children plant snowdrops and crocuses in the grass and Chinese lily bulbs in the house. In the spring they plant flowers and vegetables in the outdoor garden, choosing from the following list: nasturtium, cosmos, zinnia, aster, lettuce, radish, gourd, and pumpkin.
7. Trips to Jackson Park and to neighboring gardens and vacant lots are taken to see trees and birds and to feed the squirrels and grackles.

In this and in each of the primary grades the children keep in mind the general route of the trip. Upon their return it is laid out simply on the floor, in the sand pan, or on horizontal paper, with actual directions indicated.

8. An earthworm cage is made by the group, so that they can watch earthworms actually at work. (For details see Hodge, *Nature Study and Life*, p. 424.)
9. An "Outdoor Book" is made by each child which consists of blueprints, pictures, and his own drawings of the wild flowers, trees, shrubs, and animal life which he learns to know. This furnishes legitimate pleasure and as a record of the children's definite knowledge serves as a working basis in the following year.

The everyday experiences make the following nature material familiar to this grade:

Trees and Shrubs	Weeds	Wild Flowers	Animals
Oak	Milkweed	Sunflower	Ant
Elm	Burdock	Wild aster	Earthworm
Willow	Dandelion	Goldenrod	June bug (larva and winged stages)
Lilac	Plantain	Hepatica	
Syringa	Sand bur	Violet	Grasshopper
		Trillium	Cricket
			Ladybug
			Goldfish
			Tadpole
			Bee

10. Laboratory

Preparation of lemonade, cocoa, grape juice, butter, pop corn, oatmeal, and wheat cakes.

GRADE II

Although the same centers of interest are used again in this grade, the work here involves more consecutive records, attempts to discover cause and effect in the more obvious relations, experimentation to answer some questions which arise in the various activities, and more definite mapping of regions visited to show relative location and so to build up an idea of the Chicago region. Four new activities are added in this grade; they are numbered 11, 12, 13, and 14 in the outline below. These continue through the third grade.

OUTLINE OF MATERIALS AND ACTIVITIES

1. Care of pets
   Goldfish
   A pair of rabbits
   Canaries
2. Observation of silkworm and polyphemus moths
   Records of the life-cycles of these are made.
3. The aquarium started in the first grade is taken into the second grade, a Japanese goldfish and some snails are added, and the problem of making a balanced aquarium is undertaken. In the spring a trip is made to the swamp to gather such common material as water boatmen, whirling beetles, frogs' eggs, and dragon-fly larvae.
4. The second grade attempts to make our garden an attractive spot for birds. This involves a study of certain birds of the vicinity and their needs, and an effort to meet these needs.
5. Recognition and study of the following birds: bluebird, Baltimore oriole, summer warbler, American goldfinch, black and white warbler, sapsucker, brown thrasher, chewink, junco, red-winged blackbird, sandpiper, and kingfisher.
6. Making an indoor and outdoor garden
   The second-grade children harvest in the fall the crop which they as first-grade children planted the previous spring. They plant snowdrops, crocuses, and scillas in the grass and lilies of the valley in beds. Indoors they plant in window boxes seeds which are easily grown indoors in the winter. They set slips of geraniums and begonias. In the spring they plant vegetables in the outdoor garden, choosing from the previous year's list any they wish to continue, and potatoes, corn, carrots, or asparagus. They take charge of the garden of perennials, renewing, adding to, and tending them.
7. Trips are taken to the sand dunes, the lake shore near the German building in Jackson Park, the Field Museum, Lincoln Park, and a typical swamp.
8. An ant tray is set up containing eggs, larvae, cocoons, and adults. This has a glass top so that the work in the nest may be watched. (For details see Hodge, *Nature Study and Life*, p. 418.)
9. The "Outdoor Book" is continued. Volume II contains records of the new material studied in the grade.
   To the first-grade list of outdoor things are added:

Trees and Shrubs	Weeds	Wild Flowers	Animals
Carolina poplar	Pigweed	Spring beauty	Aphid
Silver-leafed poplar	Peppergrass	Buttercup	Soldier beetle

Trees and Shrubs	Weeds	Wild Flowers	Animals
Ash	Mullein	Wake-robin	Oak gall
Box elder	Bittersweet	Spiderwort	Goldenrod gall
Linden	Shepherd's purse	Bloodroot	Leaf miners
Forsythia	Cocklebur	Solomon's seal	Cutworm
Weigelia			Tree hopper
Sumac			Borers
			Tomato worm

10. Laboratory

Preparation of cocoa, grape jelly, baked apple, apple sauce, ice-cream, roasted nuts, baked potato, broiled bacon.

11. Mineral collection

A trip is taken to the lake shore to collect stones and start individual collections. Children make heavy cardboard boxes to hold sixteen small boxes for specimens of the following:

Limestone	Slag	Greenstone
Marble	Milky quartz	Mica
Coral	Flint	Coal
Slate	Chert	Conglomerate
Shale	Sandstone	
Shells	Granite	

12. Weather chart

A record of temperature is kept only when its relation to our garden, the animals, or the children's play gives it genuine significance. The pupils establish experimentally the freezing-point and boiling-point of water. They note the temperature at which our thermostat is set.

13. A toy menagerie is made after a visit to the Lincoln Park zoo. These animals and their environment are further studied through pictures, descriptions, and stories.

14. Seed collection

This is made by gathering seeds on the various trips, classifying them as to means of distribution, and putting away for spring planting any which we wish to perpetuate.

GRADE III

In the third grade a more definite organization of data is made, scientific problems growing out of the central activities are worked out in more detail, and the quantitative element is considered to some extent.

OUTLINE OF MATERIALS AND ACTIVITIES

1. Care of pets

   The beehive in some years is the special care of the third grade. Through reading-slips and other printed matter and by first-hand observation the children learn some fundamentals of the care of bees, and it is their duty to instruct children of the other primary grades at certain morning exercise periods so that all may be intelligent regarding the beehives.

2. Swallowtail and monarch butterflies and luna moths are studied

3. Aquarium

   The new aquarium stocked by the second grade is passed on to the third grade. In the fall newts and salamanders are the new centers of interest. The following spring a trip to a swamp is made to get crawfish, water striders, may-fly and damsel-fly larvae and to renew acquaintance with material found the previous year. These give experience with swamp life under fall as well as spring conditions.

4. Recognition and study of the following birds: catbird, fox sparrow, nuthatch, kinglet, downy woodpecker, bobolink, and rail. Nesting habits of birds. Building of bird houses. Feeding birds in winter.

5. Indoor and outdoor garden

   The garden work in this grade constitutes the basis of most of the science work. The group is responsible for the currant bushes and the raising of bulbs. The children plant tulips, daffodils, hyacinths, and narcissus in quantities out of doors. For indoor planting they choose scilla, freesia, cyclamen, or oxalis. Each child owns a pot of one of these and takes it home when in bloom.

   The children make a map of the whole garden, in which they show the plats and the shrubs and perennials. Seeds for children's individual gardens are chosen from the following list: sensitive plant, bachelor's button, daisy, portulaca, squash, cucumber, cauliflower, cabbage, tomato.

   Planting and care of shrubs which provide food for birds.

6. Field trips may be taken to give experiences in lake-shore, swamp, and dune areas. The trips of previous grades may be repeated.

7. Hibernation of animals is watched through the making of an outdoor cage for toads, turtles, frogs, and snails. The information thus gained is extended and enlarged through reading about the hibernation of these and other animals. In this connection a wild-animal scrapbook is made.

8. The "Outdoor Book" of the first and second grades changes its form but not its purpose in this grade. Here specimens of trees, shrubs, weeds, and wild flowers are added to the individual records. These are pressed and mounted under thin celluloid to keep them intact, and are placed in the museum as a means of identification for the use of children of the other grades.

The particular list of nature material which is added in this grade for identification and familiarity is as follows:

Trees and Shrubs	Weeds	Wild Flowers	Animals
Sycamore	Ragweed	Columbine	Land snails
Birch	Lamb's quarters	Crowfoot violet	Spider
Mulberry	Heal all	Dutchman's-breeches	Beetle
Horse chestnut	Wild parsley		
Catalpa	Cinquefoil	Wild geranium	
Locust	Catnip	Shooting star	
Wild cherry		Wintergreen	
Bridal wreath		Bearberry	
Barberry			
Flowering currant			

9. Laboratory

The children dry apples and grapes. In this connection some definite work in the study of evaporation is begun.

10. The mineral collection begun in the second grade is continued and enlarged here. Quartzite, iron pyrites, galena crystals, iron, silver, gold, hornblende, and mica schist are added. Such of these as cannot be found locally may be purchased from Ward's Natural Science Establishment, 84–102 College Ave., Rochester, N.Y., or Kreg, Sheerer & Co., 404 West 27th St., New York.

This grade makes rock candy for Christmas, using large quantities to secure big, perfect crystals. The children make small crystals of salt, sugar, and alum, coloring them with iron rust, copper, and other mineral coloring-matter. They visit the Field Museum to see the crystal collection.

11. The weather record in the third grade is continued on the same general plan as in the second, and during our very cold weather a chart is kept showing comparative temperatures, one in the far north, another in the far south, and the third in Chicago. Data for the first two are obtained from the daily papers. Some experiments in evaporation and condensation and in expansion and contraction of materials under heat variation are tried.

12. The wild-animal study continued from the second grade is noted in paragraph 7 above.

13. Tree-planting in the garden is taken up. With this activity goes the care of the vines to see that they are replaced and added to as necessity demands.

[*To be continued*].

THE DETERMINATION OF ULTIMATE STANDARDS OF QUALITY IN HANDWRITING FOR THE PUBLIC SCHOOLS

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It is now a commonplace to say that the advent of scales and tests for the measurement of abilities in the school subjects is making it possible for those in charge of the schools to set up definite standards of attainment. Even those only slightly in touch with the literature and practices of measurement have met with efforts at the establishment of standards by the use of these tests and scales. Occasionally the standards set are almost purely arbitrary, as, for example, when a superintendent of the writer's acquaintance, on the basis of well-nigh unsubstantiated opinion, determined that all pupils of the eighth grades in his system must attain the quality represented by 90 on the Ayres Measuring Scale for Handwriting. More frequently these standards are determined by the average or median abilities of large numbers of school children, as when we say that the standard of accuracy in subtraction in the seventh grade in a certain set of problems should be 86 per cent because the median accuracy of a large number of seventh-grade pupils in this set of problems has been computed to be 86 per cent. With the former method of determination of standards careful thinkers in education are now out of sympathy. It has regard neither for capacities of children nor for the actual need of the ability in question—two prime considerations. The latter method is much superior to it in that, in so far as the results of the tests approximate the capacities of children under present teaching conditions—and, doubtless, they throw a great deal of light on this—they tell us what children of given ages and grades may be taught to do. But this second mode of standard-setting is inadequate in that it largely leaves out of account what the actual social needs for the particular ability may be. This article constitutes an

illustration of the method of standard-setting which looks into the social need for an ability. It grows out of an investigation into the quality of handwriting actually used and demanded in purely social and in vocational activities.

A. THE QUALITY OF HANDWRITING NEEDED FOR SOCIAL CORRESPONDENCE

As implied in the last sentence, for purposes of this investigation the need for handwriting has been studied with respect to the two main classes of use to which it is put: (*a*) the purely social need as illustrated in social correspondence and comprehending most or all of the non-vocational uses we may have for handwriting; (*b*) the vocational need. The former need was investigated (1) by collecting and scoring on the Ayres Measuring Scale for Adult Handwriting specimens of actual social (non-vocational) correspondence written by 1,053 adults in various walks of life, practically all of them of the better-educated middle-class Americans, and (2) by securing and tabulating the judgments of 826 adults as to what they consider adequate and inadequate handwriting for social correspondence. The 1,053 specimens were drawn in part from the writer's social correspondence, but most of them were supplied by students in classes in education in the University of Washington and Ohio State University and by a number of other persons who clipped from such social correspondence as they had received and had at hand parts of pages large enough to be scored and representative of the handwriting of the letters from which they were cut. Each specimen was labeled so as to indicate the sex and occupation of its writer. The latter item was secured for each specimen, not primarily to get at the quality of handwriting needed for the occupation, but to note whether the occupation tends to influence the quality of handwriting in social correspondence. The occupational distribution of the writers of these specimens is presented in the order of their frequency in Table I. One important observation to be made is the wide range of occupations in which the writers are found. This is even somewhat larger than this table indicates, because group 33 itself includes single representatives of 22 occupations, among them a dramatic reader, a dairyman, a hairdresser, a

county officer, a college recorder, a dentist, a miner, a janitor, etc. Groups 1–4 include almost four-fifths of the entire number. The group of students includes exclusively those in higher institutions such as colleges, universities, and normal schools. Group 3 includes for the most part teachers in high and elementary schools, but represents also a total of 48 superintendents, principals, and university

TABLE I

DISTRIBUTION BY OCCUPATIONS OF THE WRITERS OF THE 1,053 SPECIMENS OF SOCIAL CORRESPONDENCE

1. Students	230	18. Y.M.C.A. and Y.W.C.A. workers	5
2. Homemakers	229	19. Artists	4
3. Educational workers	224	20. Chemists	4
4. Business workers	121	21. Social workers	4
5. Farmers	26	22. Society women	4
6. Soldiers	18	23. Foresters	3
7. Lawyers	17	24. Laborers	3
8. Nurses	16	25. Lumbermen	3
9. Engineers	14	26. Mechanics	3
10. Clubwomen	13	27. Telephone operators	3
11. Physicians	13	28. Electricians	2
12. Authors and journalists	11	29. Housekeepers	2
13. Clergymen	9	30. Railroad employees	2
14. Musicians	8	31. Ranchers	2
15. Librarians	6	32. Sailors	2
16. Dressmakers and milliners	5	33. Miscellaneous	22
17. Matrons in schools	5	34. Occupationless and unclassified	20
		Total	1,053

and normal-school teachers. Among the business workers are to be found stenographers, bookkeepers, bank employees, "merchants," "clerks," accountants, "business men," "business women," etc. Group 9 includes only those in the engineering profession. Under Group 34 have been placed those reported as people of leisure and those whose occupations were not reported.

The distributions in gross numbers and percentages of the scores on the scale that have been assigned to these 1,053 specimens of social correspondence are shown in Table II. The scores assigned

TABLE II

DISTRIBUTION OF THE SCORES OF 1,053 SPECIMENS OF SOCIAL CORRESPONDENCE

OCCUPATION GROUPS	Numbers of Specimens	SCORE ON THE AYRES MEASURING SCALE FOR ADULT HANDWRITING																																Average
		20		25		30		35		40		45		50		55		60		65		70		75		80		85		90						
		No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage				
1. Students	230	2	0.9	1	0.4	16	7.0	3	1.3	50	21.7	7	3.0	73	31.7	7	3.0	44	19.1	..	....	22	9.6	1	0.4	4	1.7	..	....	..	....				50.3
2. Homemakers	229	3	1.3	4	1.7	29	12.7	1	0.4	51	22.3	11	4.8	63	27.5	1	0.4	45	19.7	2	0.9	16	7.0	..	....	3	1.3	..	....	..	....				48.0
3. Educational workers	224	..	....	..	....	19	8.5	5	2.2	28	12.5	5	2.2	67	29.9	1	0.4	40	17.9	1	0.4	45	20.1	..	....	12	5.4	..	....	1	0.4				54.3
4. Business workers	121	1	0.8	3	2.4	13	10.7	..	....	22	17.4	3	2.4	35	28.9	3	2.4	19	15.7	3	2.4	15	12.4	1	0.8	3	2.4	..	....	..	....				50.5
5. Farmers	26	..	....	..	....	7	26.9	..	....	6	23.1	..	....	6	23.1	..	....	6	23.1	..	....	1	3.8	..	....	..	....	..	....	..	....				45.4
6. Soldiers	18	..	....	..	....	3	16.7	1	5.6	5	27.8	..	....	5	27.8	..	....	3	16.7	..	....	1	5.6	..	....	..	....	..	....	..	....				45.8
7. Lawyers	17	1	5.9	3	17.7	3	17.7	2	11.8	1	5.9	..	....	4	23.5	..	....	2	11.8	1	5.9	..	....	..	....	..	....	..	....	..	....				40.0
8. Nurses	16	1	6.3	..	....	2	12.5	..	....	6	40.0	..	....	2	12.5	1	6.3	2	12.5	..	....	1	6.3	..	....	1	6.3	..	....	..	....				46.6
9. Engineers	14	..	....	..	....	1	7.1	1	7.1	3	21.4	..	....	3	21.4	1	7.1	4	28.6	..	....	1	7.1	..	....	..	....	..	....	..	....				50.0
10. Clubwomen	13	..	....	..	....	..	....	..	....	..	....	1	7.7	5	38.5	1	7.7	6	46.2	..	....	..	....	..	....	..	....	..	....	..	....				54.6
11. Physicians	13	1	7.7	..	....	3	23.1	1	7.7	4	30.8	..	....	3	23.1	..	....	1	7.7	..	....	..	....	..	....	..	....	..	....	..	....				39.6
12. Authors and journalists	11	3	27.3	..	....	3	27.3	..	....	1	9.1	..	....	1	9.1	1	9.1	2	18.2	..	....	..	....	..	....	..	....	..	....	..	....				37.7
13. Clergymen	9	2	22.2	1	11.1	1	11.1	..	....	2	22.2	..	....	1	11.1	..	....	2	22.2	..	....	..	....	..	....	..	....	..	....	..	....				38.3
14. Musicians	8	1	12.5	..	....	3	37.5	..	....	2	25.0	..	....	2	25.0	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....				36.3
15. Librarians	6	..	....	..	....	1	16.7	..	....	1	16.7	..	....	2	33.3	..	....	1	16.7	1	16.7	..	....	..	....	..	....	..	....	..	....				47.5
Groups 16 to 34	98	3	3.1	2	2.0	10	10.2	1	1.0	25	25.5	4	4.1	27	27.5	1	1.0	19	19.4	1	1.0	4	4.1	1	1.0	..	....	..	....	..	....				46.8
Totals	1053	18	1.7	14	1.3	114	10.8	15	1.4	207	19.7	31	2.9	299	28.5	17	1.6	196	18.6	9	0.9	106	10.1	3	0.3	23	2.2	..	....	1	0.1				49.5

are tabulated as to occupational groups which are found in the left-hand column. It is to be noted that, because of their limited representation and the fact that no dependable conclusion may be drawn as to quality of handwriting on such small numbers of cases, occupation groups 16 to 32 have been merged for this table with

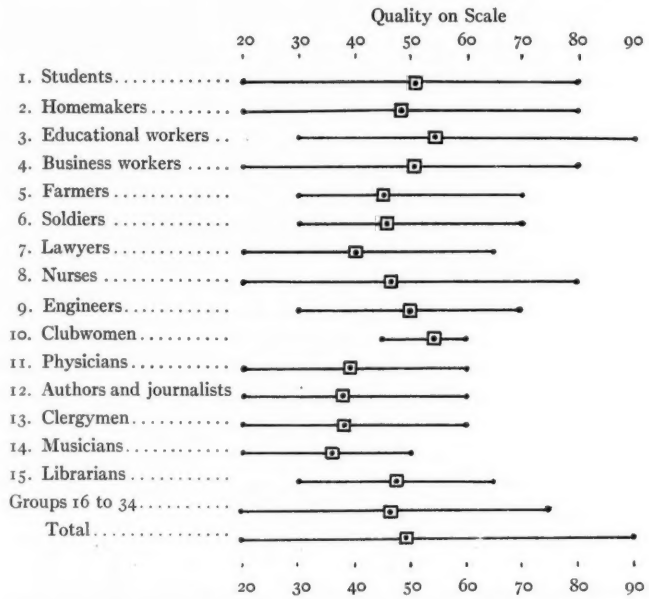

CHART 1.—Ranges and averages of the scores of handwriting done in social correspondence by persons in certain occupational groups. (The lines represent the range of quality shown by the specimens; the squares on these lines locate the averages.)

those in groups 33 and 34. This table shows also in the right-hand column the average score for each group and in the lowest horizontal column the distribution totals for all the 1,053 specimens. Chart 1 shows the range of quality and the place of the average score in this range for each group and for all the specimens.

It will be seen from the totals and percentages at the foot of Table II, and in Chart 2, which presents the same facts in graphic

form, that these qualities tend to pile up in an approximation to the curve of normal frequency, that the most common quality is 50 on the scale, and that the number of cases decreases rapidly and almost symmetrically both above and below this point on the scale. Addition of the numbers and percentages of specimens that have

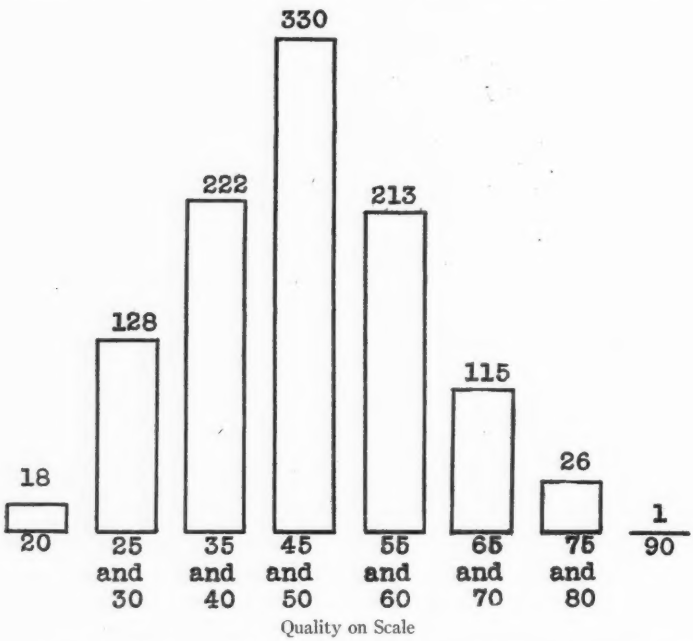

CHART 2.—Distribution of the scores of handwriting of 1,053 specimens of social correspondence.

been scored above 60 on the scale shows that *only 142, or 13.5 per cent of the total of 1,053 correspondents, write better than 60 on the scale, the remaining 86.5 per cent writing at the quality 60 or less. The average quality of the 1,053 specimens is 49.5.* Scrutiny of the percentage distributions for the several occupational groups discovers a number of interesting and significant facts. The only occupational group of the first four large ones which differs markedly

in distribution from the total is that of the educational workers, and the distribution here is somewhat more toward the upper end of the scale, 26.3 per cent of the specimens scoring above the quality 60, i.e., approximately twice as large a percentage as for the entire group of 1,053 specimens. The average for this group of educational workers is 54.3, higher by almost half a step on the scale than for the entire group. The average qualities for the clubwomen and engineers are approximately as high as for the educational workers, although the range of distribution is not so great, perhaps on account of the smaller number of specimens. The farmer writes about as well as the soldier, and, although the former's average quality is approximately a half step on the scale lower than that for the entire group, the handwriting in his social correspondence is better than that of our representatives of the more honorific professions of the lawyer, physician, writer, clergyman, and musician! However, the number of cases in some of these groups is probably too small to warrant us in drawing final conclusions as to comparative qualities.

In securing the 826 judgments on adequacy and inadequacy of handwriting for purposes of social correspondence, the specimens constituting the Ayres Measuring Scale for Adult Handwriting were used. Each of a large number of copies of the scale was cut into its twenty-four specimens, and these, containing no evidence of the score assigned to it on the scale, were shuffled and submitted to the person who was to judge them. The person judging was directed to place in an envelope marked "adequate" those of the twenty-four specimens which he regarded as adequate for social correspondence and in another envelope marked "inadequate" those which he regarded as inadequate for such a purpose. The judgments were made without consultation with other persons. Very few of the persons passing judgment on these specimens knew of their origin in the scale until after judgment had been made. This is true even of the teachers whose opinions were secured. The 826 judges for purposes of comparison have been placed in three groups: (*a*) 176 members of classes in education in the University of Washington made up of young men and women preparing for teaching positions (almost exclusively Juniors, Seniors, and graduate

students, and including only 8[1] having had teaching experience); (*b*) 414 teachers in Washington and Ohio (including elementary- and high-school teachers, those in administrative and supervisory positions, 14 in university teaching work, and only 9[1] not having had teaching experience); and (*c*) 236 other adults, non-teachers, whose judgments were secured for the most part at meetings of parent-teacher associations, women's clubs, etc.

The number of times each of the twenty-four specimens was classed as adequate by the students in education, the teachers, the non-teachers, and the total of 826 judges, and the percentages these are of the number in each group and of the total group, respectively, have been computed and are presented in Table III. This table is to be read as follows: 17, or 9.7 per cent, of 176 students in education judge the specimen assigned the quality A20 (the poorest of the vertical specimens on the scale) to be adequate for social correspondence; 31, or 17.6 per cent, A30, etc. Looking first at the totals in the right-hand column, we note that while slightly less than a third of the entire group of 826 judges are satisfied with A40, almost two-thirds consider A50 and more than three-fourths consider A60 good enough. Most of the specimens on the vertical section of the scale do not fare so well as do those of the medium-slant and extreme-slant[2] sections, leading us to conclude that the prejudice against the vertical has not yet subsided. The proportions considering each of the specimens adequate are shown again in Chart 3. The averages of the percentages for each quality as given in the right-hand column of Table III, e.g., the averages of the percentages for A20, B20, and C20, have been computed and are presented in Table IV. Chart 4 sets forth these proportions in graphic form.

Before stating conclusions as to an appropriate standard of quality for use in social correspondence, it may be well to call

[1] The judgments of these were tabulated through error in the wrong groups in such a way as to make it impossible later to identify and withdraw them. Their number is so small that they cannot affect the conclusions concerning the groups in which they are placed.

[2] Almost equal percentages of the entire group of 826 judges consider the qualities 40 and 50 on the C or extreme-slant section of the scale adequate, suggesting that the scale is improperly constructed at this point.

attention to the variation in judgment shown by the three groups into which the 826 judges have been separated. A comparison of the percentages of the non-teacher group with those of the other two groups who have considered the specimens of the scale adequate

TABLE III

NUMBERS AND PERCENTAGES OF THE JUDGES CONSIDERING THE 24 SPECIMENS IN THE AYRES MEASURING SCALE FOR ADULT HANDWRITING ADEQUATE FOR SOCIAL CORRESPONDENCE

SPECIMEN ON SCALE	STUDENTS IN EDUCATION		EDUCATIONAL WORKERS		NON-TEACHERS		ALL JUDGES	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
A 20.....	17	9.7	56	13.5	12	5.1	85	10.3
30.....	31	17.6	82	19.8	14	5.9	127	15.4
40.....	71	40.3	146	35.3	43	18.2	258	31.2
50.....	138	78.4	300	72.5	105	44.4	543	65.7
60.....	158	89.8	343	82.9	127	53.8	628	76.0
70.....	156	88.6	367	88.6	161	68.2	684	82.8
80.....	171	97.2	385	93.0	167	70.8	723	87.5
90.....	173	98.3	392	94.7	195	82.6	760	92.0
B 20.....	2	1.1	18	4.3	4	1.7	24	2.9
30.....	17	9.7	49	11.8	11	4.7	77	9.3
40.....	75	42.6	207	50.0	46	19.5	328	39.7
50.....	145	82.4	296	71.5	100	42.4	541	65.5
60.....	167	94.9	382	92.0	154	65.2	703	85.1
70.....	172	97.7	406	98.1	194	82.2	772	93.5
80.....	173	98.3	412	99.5	217	91.9	802	97.1
90.....	174	98.9	411	99.3	220	93.2	805	97.5
C 20.....	11	6.3	27	6.5	4	1.7	42	5.1
30.....	69	39.2	165	39.9	26	11.0	260	31.5
40.....	116	65.9	226	54.6	67	28.4	409	49.5
50.....	105	59.7	236	57.0	72	30.5	413	50.0
60.....	166	94.3	376	90.8	145	61.4	687	83.2
70.....	168	95.5	384	92.8	175	74.2	727	88.0
80.....	173	98.3	406	98.1	188	79.7	767	92.9
90.....	174	98.9	412	99.5	220	93.2	806	97.6
Total number of judges...	176	.....	414	.....	236	.....	826	.....

shows that in every instance the former is smaller than the latter, i.e., this non-teacher group would in general insist on a somewhat higher quality for social correspondence than would the group of students in education and the teacher group. But even in this group, if we average the percentages who consider the three specimens of the quality 60 adequate, we find that slightly more than

60 per cent, a generous majority, would approve this quality for use in social correspondence. To those who would question the ability of university students in education and of the teachers to

TABLE IV

AVERAGE PERCENTAGES OF THE 826 JUDGES CONSIDERING THE THREE SPECIMENS OF EACH QUALITY ON THE AYRES MEASURING SCALE FOR ADULT HANDWRITING ADEQUATE FOR SOCIAL CORRESPONDENCE

Specimens on Scale	20	30	40	50	60	70	80	90
Average percentage considering the specimens adequate.....	6.1	18.7	40.1	60.4	81.4	88.1	92.5	95.7

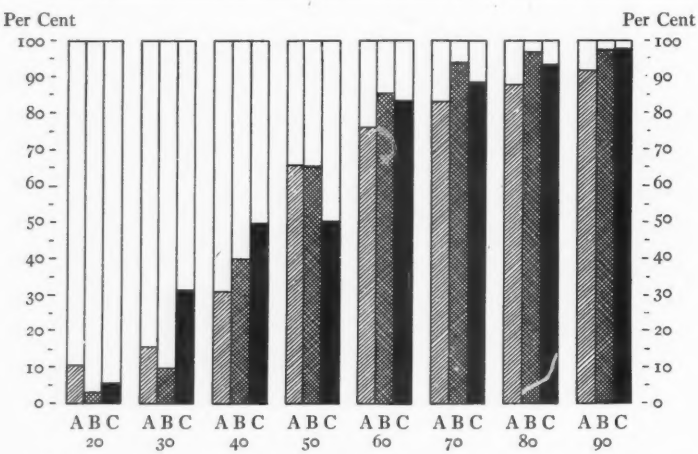

CHART 3.—Proportions of the 826 judges regarding each of the twenty-four specimens on the Ayres Measuring Scale for adult handwriting adequate for social correspondence. (Single-hatching, proportion regarding vertical specimens adequate; cross-hatching, medium-slant specimens; black, extreme-slant specimens.)

judge as well as the non-teachers the quality requisite for social correspondence, let it be said that both these groups consist of adults, that the first group is notable for the extent of its social correspondence and, therefore, at least as sensitive as any of the three groups to the social need for handwriting, and that the second group is, by virtue of its function, made up of good judges of handwriting.

Conclusion as to the standard for social correspondence.—The facts concerning the social demand for handwriting are now before us. The modal quality written by over a thousand people in actual social correspondence is 50 on the scale. Although the proportion writing as well as 60 is not negligible, only 13.5 per cent write better than this quality. To write better than 60 is to be in a small minority as concerns handwriting ability. Moreover, more than four-fifths of 826 judges consider the quality 60 adequate, with a generous majority approving the quality 50. In the light of these

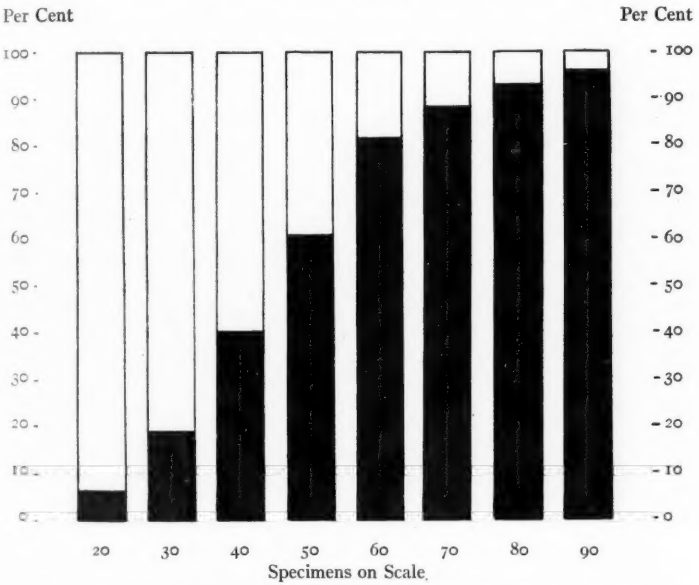

CHART 4.—Average percentages of the 826 judges considering the three specimens of each quality on the Ayres Measuring Scale for adult handwriting adequate for social correspondence. (From Table IV.)

facts, *it is difficult to see why, for the use under consideration, a pupil should be required to spend the time necessary to learn to write better than the quality 60. There is even considerable justification for setting the ultimate standard at 50. As this demand touches every member of society, all the children in the schools should be required to attain the standard set.*

B. THE QUALITY OF HANDWRITING REQUISITE FOR VOCATIONS

The quality aspect of the vocational need for handwriting was studied by scoring, again on the Ayres Measuring Scale for Adult Handwriting, the handwriting done by 1,127 employees in a number of occupations listed in the left-hand columns of Tables V and VI. The assumption is that we may use the handwriting done by these employees in establishing vocational standards, because the presence in these employments of the persons writing the specimens is proof that they write well enough for the purposes of their vocations. Brief comment needs to be made concerning most of the groups listed in the tables. The printers in Table V were employees of a large printing establishment in a city of the Middle West, most of them being apprentices, but all on the pay-roll of the company, many of them earning journeymen's wages. Group 2 includes those employed through a period of years in the trade-order department of an immense wholesale establishment. The secretary of this company informed the writer that this is the sole department in which ability in handwriting is required, all other writing work being done on machines. In this connection we should not omit reference to those officers—several in number—in large business establishments who wrote the investigator in some such strain as the following: "Practically all of the written work in our offices is done on the typewriter. Some years ago most of the work was handwork, but scarcely any penmanship is used now." The work in the department under consideration consists in jotting down in pencil on cards the names and addresses of retailers buying from the wholesale company and the amounts of such purchases by months or other periods. The specimens for group 3 were collected from the work of his employees by the owner of a "string" of banks in villages and small cities. The work of these employees in country banks is not much specialized, each of them performing a variety of functions. Group 4 includes a small number of employees in the central offices of a large fire-insurance company; group 5, the hand addressers for a large publishing house, again the only employment of the company requiring the use of handwriting; group 6, the hand addressers for an addressing company employing from one hundred to two hundred persons weekly, who are paid on a quantity basis,

TABLE V

DISTRIBUTION OF THE SCORES OF THE HANDWRITING DONE BY PERSONS ENGAGED IN CERTAIN OCCUPATIONS

OCCUPATION GROUP	TOTAL NUMBER	SCORE ON THE AYRES MEASURING SCALE FOR ADULT HANDWRITING															
		20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	Average
1. Printers*	93	....	....	1	13	15	20	13	6	11	6	5	1	2	....	....	49.5
2. Trade-order department in wholesale establishment	69	....	....	1	....	2	4	31	10	18	....	3	....	....	....	....	53.3
3. Employees in country banks	22	1	....	2	....	1	2	5	2	4	....	4	1	2	....	....	56.1
4. Insurance office employees	17	....	....	....	....	2	2	3	1	2	4	3	....	....	....	....	56.8
5. Addressers for publishing company	8	....	....	....	....	....	....	....	1	3	....	3	....	1	....	....	65.6
6. Addressers for addressing company	42	....	....	....	....	1	....	4	....	13	2	16	....	5	1	....	65.6
7. Addressers for mail-order company	272	....	....	....	....	....	1	10	12	90	26	86	30	7	....	....	63.0
8. In billing department of mail-order company	66	....	....	....	....	....	....	9	3	30	9	14	1	....	....	....	61.4
9. In check-refunds department of mail-order company	85	....	....	....	....	1	4	12	8	26	10	19	3	2	....	....	61.0
10. Elementary-school teachers	75	....	....	1	....	4	4	12	7	19	5	15	7	1	....	....	59.7
11. High-school teachers	104	....	....	4	2	13	8	31	9	20	4	8	1	3	....	1	53.3
12. University teachers	83	1	4	10	3	17	8	21	4	9	3	3	....	....	....	....	45.5

* The specimens written by the printers were scored on the Ayres Measuring Scale for Handwriting, not on the Measuring Scale for Adult Handwriting, the latter not being available at the time the scoring of these 93 specimens was done. However, the distribution and the scores for this group may be considered comparable for practical purposes with those for the remaining groups, as the writer has found by a study of his scoring of the 42 specimens in group 6 by the former scale, within a short time after the handwriting of the printers was scored, that the average score by this scale was 66.7. This is only 1.1, or about one-ninth of a step on the scale, higher than the average as here shown for this group when scored by the Adult Scale.

TABLE VI

DISTRIBUTION OF THE SCORES OF THE HANDWRITING DONE BY EMPLOYEES IN THE OFFICES OF TWO PACKING COMPANIES

DEPARTMENT	TOTAL NUMBER	SCORE ON THE AYRES MEASURING SCALE FOR ADULT HANDWRITING															
		20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	Average
1. Messenger	29	....	....	2	....	4	1	10	3	7	....	1	1	....	....	....	51.6
2. Telegraphy	9	....	....	....	....	....	....	....	....	4	2	1	1	1	....	....	66.1
3. Claim	6	....	....	....	....	....	....	1	1	2	....	2	....	....	....	....	60.8
4. Credit	11	....	....	....	....	....	....	2	2	4	....	2	....	1	....	....	60.9
5. Railroad	14	....	....	....	....	....	....	2	....	4	....	6	1	1	....	....	65.4
6. Invoice	14	....	....	....	....	....	....	1	1	4	....	6	1	1	....	....	65.7
7. Accounting	13	....	....	....	....	....	....	1	....	3	....	8	1	....	....	....	66.5
8. Distribution	7	....	....	....	....	....	....	....	....	3	....	2	1	1	....	....	67.9
9. Bookkeeping	9	....	....	....	....	....	....	1	....	1	....	5	1	1	....	....	68.3
10. Order	11	....	....	....	....	....	....	....	....	2	2	5	1	1	....	....	68.6
11. Account sales	12	....	....	....	....	....	....	....	....	3	....	5	....	3	1	....	71.3
12. Miscellaneous	56	....	....	....	....	....	....	10	8	19	3	9	3	3	1	....	61.7
13. Summary of 3–12 inclusive	153	....	....	....	....	....	....	18	12	45	5	50	9	12	2	....	64.6

and who do approximately 75 per cent of all addressing work cared for by the company. Hand addressing is again represented in group 6, which includes 272 persons in the employ of one of the largest mail-order houses of the country. The next two groups, 8 and 9, are employees in other departments of the same company. Table VI presents the scores given specimens written by the employees in the central offices of two packing companies. Where the numbers of specimens were large enough, they have been clas-

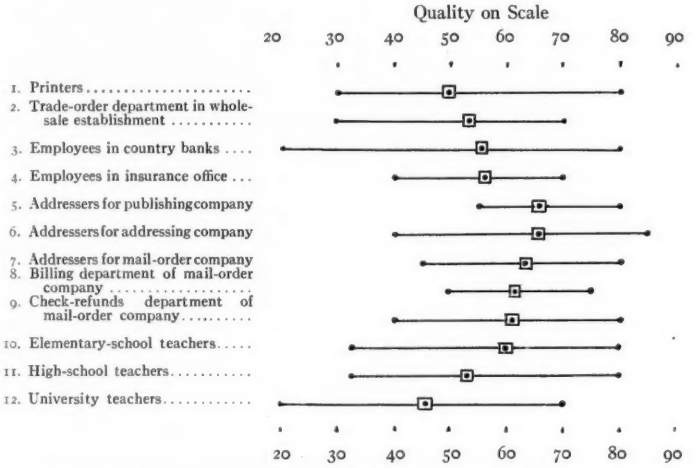
Quality on Scale
20 30 40 50 60 70 80 90
1. Printers
2. Trade-order department in wholesale establishment
3. Employees in country banks
4. Employees in insurance office
5. Addressers for publishing company
6. Addressers for addressing company
7. Addressers for mail-order company
8. Billing department of mail-order company
9. Check-refunds department of mail-order company
10. Elementary-school teachers
11. High-school teachers
12. University teachers
20 30 40 50 60 70 80 90

CHART 5.—Ranges and averages of the scores of handwriting done by persons in certain occupation groups. (From Table V. The lines represent the range of quality shown by the specimens; the squares on these lines locate the averages.)

sified by groups representing departments, but where the numbers of specimens representing departments have been 5 or less, they have been merged in group 12 as "miscellaneous." It will be noted that departments 1 and 2 represent employments not usually classed as clerical or business occupations, although they are associated with such occupations.

We may now turn our attention to the quality of the writing used in the occupations or vocations represented, as shown in Tables V and VI and their corresponding charts, 5 and 6. The

latter present graphically the range of quality for each of the occupations and the place of the average quality in this range. In the extreme right-hand column in the tables is given the average for the occupation. Printers write from the quality 30 to the quality 80 on the scale, the average being 49.5. Sixty-one, or approximately two-thirds of this group, write from 35 to 50 inclusive. In the series of business employments in groups 2–9 in Table V we

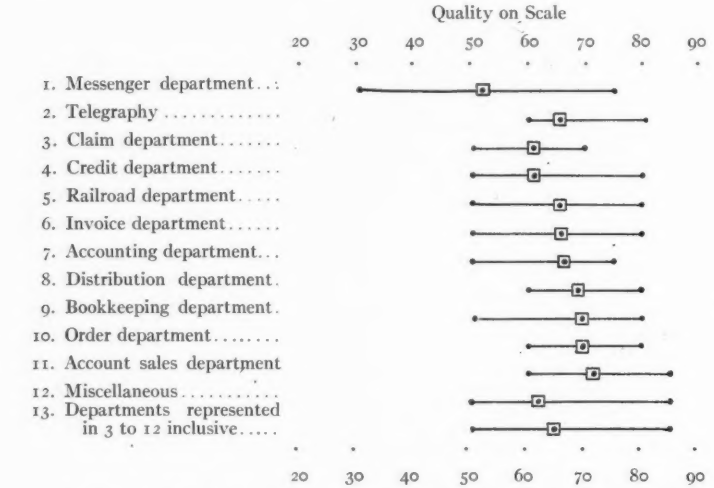

CHART 6.—Ranges and averages of the scores of handwriting done by employees in the offices of two packing companies. (From Table VI. The lines represent the range of quality shown by the specimens; the squares on these lines locate the averages.)

note a demand for a better quality of handwriting than seems to be required of those working at the trade of printing, relatively few of the specimens falling below the quality 50, with the averages for these groups ranging from 53.3 to 65.6. Large proportions of groups 5–9 write as well as 60 and 70. The facts for the teaching profession presented in groups 10, 11, and 12 supply an interesting comparison both with the other groups in this table and with one another. The distribution for elementary-school teachers is somewhat toward the upper half of the scale, only a small proportion

writing below the quality 50, and the average for the group being almost 60. This contrasts rather strikingly with the distributions and averages for the remaining two teaching groups and conforms no doubt in some measure to the fact that teachers in elementary schools are particularly concerned with the teaching of writing. Table VI and Chart 6 show that, except in the messenger service, the handwriting of no employee in these groups drops below the "deadline" set by the quality 50. In the group of telegraphers and in three of the strictly commercial occupations, viz., groups 8, 10, and 11, no one writes a quality poorer than 60. On the other hand, relatively few in any of these departments write a quality better than 70 on the scale. The averages, also, of the telegraphers and of the commercial workers are uniformly high, while the average for the entire group of 153 strictly commercial employees summarized in group 13 is 64.6, a point approximately half-way between the qualities 60 and 70 on the scale.

The reader will find it interesting and profitable at this point to compare the facts appearing in this study with the findings in an investigation made by Freeman[1] into the quality on the Ayres Measuring Scale for Handwriting which employers of clerical workers regarded as "essential" and "desirable" in certain occupations. With infrequent exceptions, the employers responding regarded the qualities 60 and 70 as "essential," their opinions thus conforming rather closely to the facts as found in the investigation reported upon in the present article. The exceptions are four instances of the specification of a quality lower than 60 and three higher, one of these higher being an 80 and the two remaining—for the employees of a correspondence school—90. In most instances these employers consider a higher quality "desirable."

Although the facts were gathered for the purpose of determining the ultimate standard of quality for use in social correspondence and not for the standard for vocational uses, we may now revert to Tables I and II for further light on the handwriting ability requisite in certain vocational groups. This is justified by the large probability that the individuals concerned will write the same quality

[1] Frank N. Freeman, "Handwriting," chap. v in the *Fourteenth Yearbook of the National Society for the Study of Education*, 1915.

in such vocational use as they may have for handwriting as they do in their social correspondence. We have already noted that the representatives of some of the professional groups write at a low average quality. As a matter of fact, they write at a lower average quality than do the skilled and unskilled laborers of this entire group of 1,053 social correspondents, as is to be seen in Table VII. In the skilled and unskilled labor group of 56 of this table have been included those reported as being farmers, dressmakers and milliners,

TABLE VII

DISTRIBUTION OF SCORES OF THE HANDWRITING DONE IN SOCIAL CORRESPONDENCE (*a*) BY SKILLED AND UNSKILLED LABORERS AND (*b*) BY PROFESSIONAL WORKERS

SCORE	IN SKILLED AND UNSKILLED LABOR		IN PROFESSIONS	
	No.	Percentage	No.	Percentage
20	1	1.8	11	9.3
25			5	4.2
30	9	16.1	18	15.2
35			4	3.4
40	13	23.2	24	20.3
45			4	3.4
50	16	28.6	24	20.3
55			4	3.4
60	14	25.0	17	14.4
65			3	2.5
70	2	3.6	3	2.5
75	1	1.8		
80			1	0.8
Total	56	100.1	118	99.7
Average score	47.6		43.1	

laborers, mechanics, telephone operators, electricians, housekeepers, railroad employees, ranchers, sailors, hairdresser, shipfitter, dairyman, carpenter, miner, and janitor. In the professional group of 118 (exclusive of educational workers) have been included lawyers, nurses, engineers, physicians, authors and journalists, clergymen, musicians, librarians, Y.M.C.A. and Y.W.C.A. workers, artists, chemists, social workers, dramatic reader, agricultural-extension worker, college recorder, dentist, architect, etc. The averages of the qualities written by these two groups are, respectively, 47.6 and 43.1. The modal quality for each group is 50.

A considerable proportion of both groups—more of the laborers than of the professional workers—write as well as the quality 60, but very few of either group exceed it. One is led to conclude that for vocational uses neither laborers nor professional workers (other than educational workers) have need to write a quality better than 60.

Conclusions as to the standards for vocational uses.—From the facts that have been presented touching the ability in handwriting of persons engaged in various occupations it seems to the writer that *the quality 60 on the Ayres Measuring Scale for Adult Handwriting which we have set up as the ultimate standard of attainment for all school children for purely social purposes is adequate for the needs of most vocations. This will apply to labor, skilled and unskilled, as well as to the professions, exclusive of teaching in the elementary schools. For that large group who will go into commercial work, for telegraphers, and for teachers in the elementary schools it will be necessary to insist upon the attainment of a somewhat higher quality, but hardly in excess of the quality 70.* The fact that some will go into pursuits demanding a quality better than 60 should not be offered as a justification for requiring all pupils to attain that better quality. Such a requirement would entail the waste of a vast amount of time on the part of both teachers and pupils. Who shall be taught this better quality is a problem of educational and vocational guidance. Since all should be required to learn to write as well as 60 on the scale for the purely social uses, to train pupils to write this quality is the task of *general* education; to teach some who are going into commercial or other vocations requiring a higher quality of handwriting to write this better quality is the task, not of general, but of *vocational*, education. Many high-school commercial departments have long since recognized this distinction by giving special training in handwriting to those enrolled in their work.

In an investigation into the handwriting abilities of the pupils in the elementary schools of a number of large cities a few years ago Freeman[1] found the average score on the Ayres Measuring Scale for Handwriting in the eighth grades to be 62.8. Assuming the corresponding qualities on the Measuring Scale for Handwriting

[1] *Loc. cit.*

and the Measuring Scale for Adult Handwriting to be equivalent—which doubtless is true for practical purposes—we may conclude that the average city school is teaching the average child to write amply well. However, as this is the average, there must be many children in many cities who are not learning to write well enough and many others who learn to write too well. It has already been stated above that the standard is one for *all* children to attain; it is not one to be attained as an average for a class or school or system. When a child has attained the standard quality, his time should be devoted to the attainment of some other skill or knowledge for which he has need. The attainment of such a standard by all children of the public schools will make it possible for the schools to escape much of the unfavorable criticism to which they are now subjected because of the handwriting done by those among their product who write too poorly, i.e., below the quality 60 on the scale.

CONCERNING THE RELIABILITY OF THE CONCLUSIONS OF THIS STUDY

Among the questions concerning the validity of the conclusions of this study that may arise is this: May the scoring done by the writer be depended upon to be representative, or does it deviate so widely from that done by others as to invalidate the conclusions drawn? To settle this point the writer has recently scored 140 specimens of handwriting for which Dr. Frank N. Freeman has obtained standard scores. The method of arriving at these standard scores will first be briefly described. The specimens were graded separately by three persons, each of whom had made extensive experiments with the Ayres Measuring Scale for Handwriting. On all the specimens on which there was agreement this score was taken. When there was disagreement, the graders had a conference and arrived at a score upon which they could agree. In some cases Dr. Freeman made a final revision after a conference with one of the graders. From a practical point of view, the scores arrived at in this manner should be reasonably reliable. The average of the standard scores of the 140 specimens is 47.3. The writer has found the averages of his scores of these specimens on both the Measuring Scale for Handwriting and the Measuring Scale for Adult Hand-

writing to be 48.5 and 47.6, respectively. Thus, the scoring done on the former scale by the writer tends, on the average, to be slightly higher than the average of the standard scores. The difference is but 1.2, or less than one-eighth of a step on the scale—for practical purposes a negligible deviation. The average score on the Measuring Scale for Adult Handwriting, the scale used in the investigation reported in this article, is seen to deviate even less from the average of the standard scores. The summary of the deviations in scoring by the adult scale is presented in Table VIII.

TABLE VIII

DEVIATIONS FROM STANDARD SCORES IN SCORING 140 SPECIMENS OF HANDWRITING

Deviation from Standard Score	Number of Specimens
0	32
− 5	33
+ 5	25
−10	17
+10	16
−15	5
+15	9
−20	1
+20	1
+25	1
Total number	140

It is to be noted that for the scores of 90, or almost two-thirds, of the specimens there was either no deviation or a deviation of only half a step on the scale. In 33 cases there was a deviation of a full step on the scale and in only a small proportion of cases more than a step. Furthermore, the deviations above and below the standard scores are approximately equal in number. Exception may hardly be taken to the conclusions drawn on the ground of unrepresentative scoring.

Another question refers to a possible deterioration in quality of handwriting after the pupil leaves the elementary school and either becomes a student in the high school or does not continue his education beyond the elementary school. If the quality of handwriting tends to deteriorate after acquisition, will it not be necessary, it

may be asked, to teach a quality higher than the standard here proposed in order to allow for deterioration down to the requisite quality? Such evidence as is presented at this point, although not sufficiently extensive to establish beyond a doubt the fact of maintenance, points definitely in that direction. The situation as it concerns deterioration or maintenance of quality in handwriting in the high school may be illustrated by the findings of an investigation made in the Lincoln High School[1] of Seattle. The writing done by Freshmen and Seniors in classes in English was scored on the

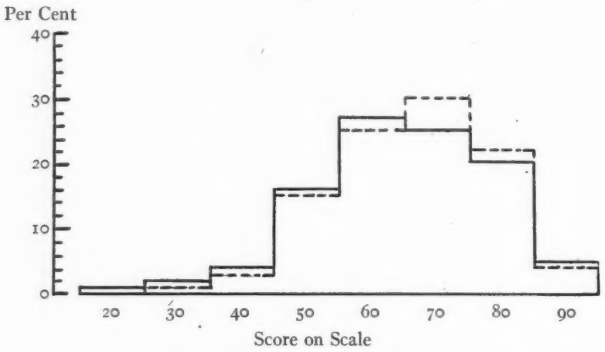

CHART 7.—Distribution of the sources of the handwriting done in English classes by high-school Freshmen and Seniors. (Solid line shows distribution for Freshmen; broken line, for Seniors.)

Ayres Measuring Scale for Handwriting, the percentage distributions of the scores being as shown in Chart 7. Computed on these percentage distributions the averages for Freshmen and Seniors are, respectively, 64.6 and 66.2. Both the percentage distributions and the averages indicate improvement, although it is not large in amount. While the proper test would be, not the scoring of the handwriting of Freshmen and Seniors of any one semester or school year, but of the specimens of the handwriting of the same pupils as Freshmen and again as Seniors, three or four years later, yet we are

[1] For the use of the facts here cited acknowledgment is made to Frederick E. Clerk, formerly principal of the Lincoln High School, now assistant superintendent of schools, Cleveland, Ohio.

probably safe in concluding that there is no tendency toward deterioration of quality of handwriting in the high school.

With the aim of detecting deterioration in quality of handwriting done by persons who have left school the writer has scored the handwriting done in social correspondence by 27 boys who left school in seventh, eighth, or ninth grade. All of these boys went into employments requiring no or very infrequent use of handwriting. For each boy two specimens were available, one written shortly after his leaving school and another written from two to five years subsequent to the writing of the former. The average of the scores of the earlier and of the later specimens are, respectively, 52.8

TABLE IX

CHANGES IN QUALITY OF HANDWRITING FOUND IN 27 PAIRS OF SPECIMENS WRITTEN BY BOYS WHO HAVE LEFT SCHOOL

Change in Quality	Number of Cases
0	10
+ 5	9
+10	3
− 5	3
−10	2
Total number	27

and 54.3. The changes in quality shown in the 27 pairs of specimens are presented in Table IX. Although 27 cases are too few from which to draw an indubitable conclusion, we note again, as in the case of students in high school, no tendency toward deterioration of quality of handwriting.

We are also justified in asking whether the investigation has been sufficiently extensive to solve finally the problem of ultimate standards of quality in handwriting for the public schools. We shall need to be ready, of course, to defer to conclusions drawn from more and better facts than have here been presented. It must be admitted, also, that facts concerning certain occupations left unexplored by the present investigation may lead to a modification of the conclusions as to standards requisite for vocational uses. But it should be kept in mind that the specimens of social correspondence used were for the most part those written by the better

educated of the middle-class Americans, that the judgments concerning adequacy and inadequacy of the specimens on the scale were likewise those of the better educated and more educationally interested, and that the numbers of specimens used in the study of both the social and the vocational needs were by no means small.

To those now contending for scientific method in curriculum-making there will be little question as to the appropriateness of the method of this investigation—that of studying social and vocational uses to assist in discovering how well we should be taught to write. We should not lose sight of the fact that these persons whose handwriting has been scored would be writing a better quality than here shown were social and vocational pressure emphatically in that direction; they may be said to be meeting the demands for handwriting that are being made upon them. Also, the standards set are not those of the minimum quality found, nor even the mode or average, but that of the highest large group found in the distributions, although there is considerable justification for the acceptance of some such point as the mode or average as the standard. Certainly, the facts presented are not less than material testimony for the problem of standard-setting.

THE CLEVELAND SURVEY TESTS IN ARITHMETIC IN THE MIAMI VALLEY

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During February, 1917, the arithmetic tests used in the Cleveland Survey were given in a number of the smaller cities and villages and also in a considerable number of the rural schools of the Miami Valley in southwestern Ohio. To be more specific, there were represented seven city and village systems and all the rural schools of one county and those of one of the several supervision districts of another county. The purpose in giving the tests was to find out the quality of work done along abstract lines (1) in the several systems individually, (2) in all the city and village schools as compared with all the one-room rural schools, and (3) in the city, village, and rural schools as compared with the Cleveland schools. The tests were given under the direction of Professor W. S. Guiler, of the Teachers' College of Miami University, and the papers were scored and the results compiled by the graduating class of that institution. About three thousand papers were obtained, quite evenly divided between town and rural schools. The reason why there was not a larger number of papers from the town schools is that the tests were given to representative schools in the larger places only. It was found impossible on account of limitations of time and labor to give them to all the schools of these systems.

The results obtained are indicated in Table I. The first score in each set is the median for the Cleveland schools. The second is the score of the city and village schools, and the third that of the rural schools participating in this survey.

Set A.—The children of the city and village schools have made a good start in simple addition in the fourth grade. There is considerable improvement up to the eighth grade, however, and the rate of progress is quite consistent, which is contrary to the findings in Cleveland. Village and city schools make as good a score in the

TABLE I

		Grades				
		4	5	6	7	8
Set A: Addition of one-place numbers	1	17.8	22.5	24.8	26.7	27.5
	2	17.8	21.3	23.4	26.6	29.2
	3	.....	19.8	23.3	25.1	29.8
Set B: Subtraction of one-place numbers	1	13.4	17.2	19.8	21.5	26.0
	2	10.6	14.5	16.0	18.9	21.0
	3	.....	13.5	13.9	19.3	22.9
Set C: Multiplication of one-place numbers	1	12.0	15.5	16.6	17.7	19.0
	2	10.5	12.2	14.6	16.8	16.9
	3	.....	12.7	16.2	17.8	19.3
Set D: Division of one- or two-place numbers by one-place numbers	1	12.4	15.7	18.5	20.8	22.5
	2	.....	12.3	14.5	17.3	18.9
	3	9.2	12.9	15.8	17.3	22.4
Set E: Addition of s ngle columns of five figures	1	5.3	6.3	6.8	7.5	7.8
	2	3.8	4.9	5.0	5.8	6.1
	3	.....	4.1	4.8	5.4	6.7
Set F: Subtraction of three-place numbers from three- and four-place numbers	1	4.9	6.7	7.5	8.6	10.1
	2	3.4	5.1	6.1	7.3	8.0
	3	.....	4.7	6.8	7.1	9.9
Set G: Multiplication of four-place numbers by one-place numbers	1	3.9	5.2	5.5	5.9	6.6
	2	2.9	3.8	4.4	5.8	5.9
	3	.....	3.8	5.0	5.2	6.3
Set H: Addition and subtraction of fractions with common denominator	1	0.0	5.0	5.5	7.7	8.5
	2	0.0	2.7	2.9	3.8	4.8
	3	.....	2.5	5.8	6.4	8.3
Set I: Division of five-place numbers by one-place numbers	1	1.1	2.0	3.1	4.0	4.7
	2	0.6	0.9	1.7	2.7	3.8
	3	.....	.1	2.1	2.9	3.8
Set J: Addition of single columns of 13 figures	1	3.2	4.0	4.4	4.9	5.7
	2	2.0	2.0	3.4	3.8	4.6
	3	.....	2.5	3.2	3.8	4.6
Set K: Division of two- and three-place numbers by two-place numbers	1	4.0	6.8	8.5	10.1	12.5
	2	1.7	2.5	4.1	6.3	7.7
	3	.....	3.1	5.1	6.9	9.5
Set L: Multiplication of four-place numbers by two-place numbers	1	1.7	2.5	2.8	3.2	3.9
	2	1.0	1.8	3.4	3.2	3.8
	3	.....	0.9	1.6	2.9	4.1
Set M: Column addition of 5 four-place numbers	1	2.5	3.2	3.8	4.4	5.1
	2	1.6	2.4	3.2	3.6	4.3
	3	.....	2.4	3.3	2.4	4.4
Set N: Division of five-place numbers by two-place numbers	1	0.8	1.3	1.7	2.0	2.6
	2	0.5	0.6	0.0	1.3	1.6
	3	.....	0.8	0.8	1.1	1.7
Set O: Addition, subtraction, multiplication, and division of fractions	1	0.0	0.0	3.1	4.1	5.5
	2	0.0	1.8	2.5	2.9	3.4
	3	.....	0.7	2.6	3.0	3.8

fourth grade, and both city and rural schools excel the Cleveland score in the eighth grade.

Set B.—Pupils do not do so well as in simple addition. The score throughout the grades is lower than in Cleveland. Apparently subtraction is more poorly taught than in Cleveland because in Set F, too, the schools in the Miami Valley are doing rather poorly as compared with those of Cleveland. Individual schools, however, excel the median for Cleveland in certain grades. No such marked superiority of eighth-grade over seventh-grade pupils was found as in Cleveland except in case of Set F, where the eighth grades of the rural schools excel the score of the seventh grades by 2.8 points, the greatest increase along the line.

Set C.—Both village, city, and rural schools make unsatisfactory scores; they also fall below the Cleveland median except in the case of the seventh and eighth grades of the rural schools, which slightly excel the Cleveland schools. On the whole the rural schools did decidedly better than the city and village schools taken as a group. One of the village schools, however, exceeds the record of all rural schools by 0.5 point. The rate of improvement for Grades 6 to 8—Grade 8 of the city systems excepted—in both types of schools is greater in this set than in the Cleveland schools.

Set D.—Here again village and city schools make a rather poor showing in the fourth grade, 9.2 as compared with 12.4 of the Cleveland schools. This is brought about largely, as in the preceding tests, by the poor showing of one of the systems in which the median for this grade is 5. The rural schools too make a rather mediocre showing as compared with the Cleveland score, 12.9 against 15.7 (fifth grade). The gain from grade to grade is but slight until the eighth grade is reached. In this grade the rural schools exceed their seventh-grade score by 5.1 points, almost equaling the Cleveland standard. Village and city schools do not reach the final score which one had a right to expect from the performances of the earlier grades. This is due to the low scores of two of the systems (4 and 6) in the eighth grade.

Set E.—The results in this test are disappointing from the point of view of schools taken both individually and jointly. Judd points out that the Cleveland scores are relatively higher for this column-addition test than for the simple-addition test, Set A. This is not

true for the schools included in this survey. In practically every instance the score is below both the Cleveland standard and the record made in Set A. Evidently too little emphasis is placed upon column addition and too much upon simple addition in the schools measured; for while they ranked below the Cleveland scores in Set E they ranked above them in Set A. This is especially true of individual schools.

Set F.—The scores are again somewhat below the Cleveland standard although the eighth grade of the rural schools is only 0.2 point below the Cleveland median. There is no decided increase from the seventh- to the eighth-grade median except in case of the rural schools. The rate of increase from the fourth to the eighth grade in city and village schools varies from 0.7 to 1.7 points, the average being 1.15. The eighth-grade score is 0.7 point above that of the seventh grade, less than the average increase of all grades. In the case of rural schools, however, we find the sharp increase in the eighth-grade score over that of the seventh grade; but there is a similar increase in the case of the sixth-grade score over that of the fifth. It would seem from these data that a sharp increase in the eighth-grade score over the seventh-grade score due to greater maturity of pupils as asserted by Judd is not general.

Set G.—If we leave the eighth grade out of consideration there is a fairly consistent improvement from grade to grade in city and village schools. The rate of improvement is considerably greater in Grades 6 and 7 of city and village schools than in the same grades of the Cleveland schools, while in the rural schools the sixth and eighth grades excel the corresponding grades of the Cleveland system. The fifth grade of the city schools attains a score of 0.9 point above that of the fourth grade; the sixth grade makes twice as great an improvement over the fifth grade as in the Cleveland schools; the seventh grade here makes the greatest of all gains, 1.4 points, three times that of the Cleveland schools. The eighth grade makes the least improvement. In the rural schools there is a very decided improvement in the sixth and eighth grades, but only a very slight one in the seventh. Furthermore, with the exception of the sixth grade, the rate of progress from grade to grade of city and village schools in Set G is fairly consistent with that of

Set C, as may be shown by a comparison of gains made by both the city and the village schools in the two sets. For rural schools this is not the case. The gains are shown in Table II. As far as results in this test go there is but slight indication that the rate of progress with this complex form of multiplication closely correlates with the maturity of the pupils tested. In general, no doubt, this is true, but in this particular test it is questionable whether the greater maturity of the pupils is the cause of the comparatively high score made in the Cleveland schools.

TABLE II

Set	Grades			
	5	6	7	8
	City and Village Schools			
C.....	1.7	2.4	2.2	0.1
G.....	0.9	0.6	1.4	0.1
	Rural Schools			
C.....	.....	3.5	1.6	1.5
G.....	.....	1.2	0.2	1.1

Set H.—Judging by the returns from this test the teaching of fractions appears to be but poorly accomplished in some of the systems tested. City and village schools as a whole made a poorer score than either the rural schools or Cleveland. Both at the start and in the final grade do the city and village schools measured fall behind the Cleveland standard, more so than in any other test of the series except K, long division. More surprising still is the fact that certain systems make their highest scores in the fifth and eighth grades, the scores in Grades 6 and 7 being lower than those of the fifth grade. Evidently some changes in the courses of study or in their administration are needed to overcome this difficulty. Apparently no real effort is made to apply the knowledge of fractions which children have gained in the fifth grade during the following two years of school. While the rural schools are decidedly below the Cleveland score in the fifth grade they make a very creditable

showing in the later grades, excelling Cleveland in the sixth grade and almost equaling the Cleveland median in the eighth grade.

Sets I, K, N (division).—The form of progress of the schools measured differs materially from that of the Cleveland schools in each of these tests, as may be seen from Table III. This table should be read as follows: In Cleveland the fifth grade made a gain of 82 per cent upon the score of the fourth grade in Set I, while the corresponding grade in the city and village schools measured shows an increase of only 50 per cent. From this table it will be seen that in city and village schools progress in the sixth and seventh grades is decidedly greater than in the corresponding grades in Cleveland

TABLE III

RATE OF PROGRESS IN SETS I, K, AND N COMPARED

School	Division Tests	Grades			
		5	6	7	8
Cleveland	I	0.82	0.55	0.29	0.17
	K	0.70	0.25	0.18	0.23
	N	0.62	0.30	0.17	0.30
City and village	I	0.50	0.88	0.58	0.40
	K	0.47	0.64	0.53	0.22
	N	0.20	.....	1.16	0.23
Rural	I	.....	0.90	0.38	0.31
	K	.....	0.64	0.35	0.37
	N	.....	.....	0.37	0.54

except in the case of Set N. In this test the sixth grade fails to score. The gain of the eighth grade over the seventh grade is greater than in Cleveland in Set I, but somewhat less in Sets K and N. In case of the rural schools we have the greatest gain in the sixth grade, the first grade where gain can be measured, in Sets I and K, but no increase in Set N. The gain of the seventh and eighth grades in Sets I and K is decidedly less than in the sixth grade, corresponding to the Cleveland rate of progress, while in Set N there is a very positive increase for the last two grades which is contrary to the Cleveland score. It is inconceivable that the very poor showing in Set N is due entirely to the complexity of the exercise. It is more likely to be due to the fact that teachers fail

to see the importance of teaching children rapid methods of determining a quotient by the use of an approximate trial divisor. To divide 36,084 by 97 is practically no more difficult than to divide the same number by 17, provided the pupil has been taught to use 100 as the approximate divisor instead of 97. In so far as there is any difference this is due to the greater difficulty of multiplying by 9 rather than by 1.

Sets E, J, M (addition).—The schools measured fall below the Cleveland standard in all three of these tests, most of all in Set E, and least in Set M. The rate of progress in city schools decreases, although not regularly, in Sets E and M from the fifth to the eighth

TABLE IV

RATE OF PROGRESS IN SETS E, J, AND M COMPARED

School	Column-Addition Tests	Grades			
		5	6	7	8
Cleveland	E	0.18	0.08	0.10	0.04
	J	0.25	0.10	0.11	0.16
	M	0.28	0.18	0.16	0.18
City and village	E	0.28	0.02	0.16	0.05
	J	.....	0.70	0.11	0.21
	M	0.50	0.33	0.13	0.19
Rural	E	.....	0.17	0.12	0.24
	J	.....	0.28	0.18	0.21
	M	.....	0.29	−0.27	0.83

grade, and is erratic in Set J, in which the sixth grade makes an exceptional gain. In case of the rural schools there is an increase from the sixth to the eighth grade in Sets E, J, and M. The unusual element in these tests is the unsatisfactory work of the seventh grade, in Set M especially. Closer supervision of this part of the work and possible changes in the courses of study suggest themselves as means to overcome these unsatisfactory conditions. Table IV shows the rate of progress from grade to grade in these three tests. It should be read: Grade 5 of the city and village schools makes a gain of 28 per cent upon the score of the fourth grade, etc.

Set O.—Some of the schools measured do not study fractions in any serious way until the sixth grade is reached, while others begin

in the fifth grade. This accounts for the low scores of both city and rural schools in the earlier grades. It does not justify the poor progress in the later grades and the comparatively low final attainment of both classes of schools. While the scores for both classes of schools indicate fairly consistent progress, individual schools vary considerably from the general tendency. Thus one system making a score of 3.1 in the fifth grade never again rises above 2.5. Apparently fractions are "finished" in the fifth grade and never again studied in any systematic way. Reorganization of the course in arithmetic should make for more uniform and greater progress in this system.

VARIABILITY OF CHILDREN AND SCHOOLS

WHAT DOES GRADUATION FROM THE RURAL SCHOOL SIGNIFY?

VARIABILITY AMONG CHILDREN

Assuming that the lowest 10 per cent of pupils will fail to complete their work in the eighth grade, it means that a graduate from this grade can write the answers between the limits indicated in Table V.

TABLE V

Set	A	from	21	to	54	Set	I	from	1 to 8
"	B	"	15	"	40	"	J	"	1 " 10
"	C	"	13	"	45	"	K	"	3 " 18
"	D	"	15	"	38	"	L	"	1 " 9
"	E	"	5	"	19	"	M	"	1 " 11
"	F	"	5	"	19	"	N	"	0 " 6
"	G	"	3	"	13	"	O	"	0 " 12
"	H	"	3	"	24				

In city and village schools pupils in the eighth grade—omitting the lowest 10 per cent—vary as shown in Table VI.

TABLE VI

Set	A	from	21	to	55	Set	I	from	1 to 9
"	B	"	13	"	50	"	J	"	2 " 10
"	C	"	11	"	32	"	K	"	1 " 9
"	D	"	12	"	38	"	L	"	1 " 24
"	E	"	3	"	12	"	M	"	1 " 9
"	F	"	5	"	16	"	N	"	0 " 5
"	G	"	3	"	13	"	O	"	0 " 10
"	H	"	0	"	15				

Unless 10 per cent of the children fail to be promoted, the variability is considerably greater, the lower limit extending to zero in

every test except D for the rural schools, and D, F, and G in city and rural schools.

VARIABILITY AMONG SCHOOLS

Not only is there considerable variability among *pupils* taking the test, but the same is true of *schools*. In the case of city and village schools the scores attained vary, as may be seen in Table VII.

The rate of progress from grade to grade is very uncertain. Thus System IV, while uniformly low in the fourth-grade scores owing to the influx of foreign children at this point, makes very decided progress from the fourth to the fifth grade. But from this

TABLE VII

Set	Grades				
	4	5	6	7	8
A	13.6–19.9	19.0–24.0	20.0–26.7	19.0–27.6	26.3–32.3
B	7.0–12.9	12.4–19.1	14.4–20.6	16.0–26.7	19.2–24.0
C	5.9–14.3	10.1–17.5	11.0–18.6	13.7–19.5	14.0–19.8
D	5.0–12.5	10.0–17.6	11.0–18.4	15.4–22.3	18.8–21.0
E	3.0– 4.7	3.8– 5.6	4.1– 5.8	3.0– 6.8	5.0– 6.7
F	2.6– 4.7	4.5– 6.7	4.0– 7.6	6.0– 8.8	6.7–10.5
G	2.1– 3.7	2.0– 4.5	3.1– 5.3	4.6– 5.7	5.4– 6.2
H	0.0– 0.0	0.0– 7.1	1.1– 6.0	1.0– 4.8	2.8– 9.0
I	0.0– 1.2	0.0– 1.8	1.3– 4.3	1.9– 4.6	3.1– 4.6
J	1.4– 2.5	2.0– 4.0	2.0– 4.1	2.7– 4.3	4.0– 6.6
K	0.0– 2.6	1.8– 6.5	2.8– 5.0	5.1– 9.3	6.3–17.3
L	0.0– 2.7	1.0– 2.4	1.8– 3.8	2.6– 5.2	3.3– 5.6
M	1.2– 2.5	1.0– 3.3	2.3– 4.6	3.0– 4.8	3.7– 4.8
N	0.5– 0.8	0.0– 0.7	0.0– 2.6	0.0– 1.6	1.0– 2.6
O	0.0– 0.0	0.0– 3.1	1.0– 3.5	2.4– 4.6	2.5– 5.3

point progress is often very slow, and in at least one test (H) the fifth-grade score in this system is the highest attained by any grade. The score in Set E of the fourth grade in System VIII is 0.1 of a point higher than that of the seventh grade in the same system; but the eighth-grade score is $66\frac{2}{3}$ per cent higher than that of the seventh grade. The same system in Set H makes a score of 4.5 in the fifth grade, 5 in the sixth grade, 1 in the seventh grade, and 5.8 in the eighth grade. In Set I of this system the scores from the fourth to the eighth grade are 0.0, 1.9, 1.9, 4.4. The same variability in rate of progress from grade to grade might be illustrated from every system tested. While the decreased rate of

progress in some instances may be due to lower mental ability on part of the grade as a whole, undoubtedly many times it is due to poorer teaching or to an unsatisfactory course of study. Supervisors should ascertain whether it is the one or the other cause which makes for poor work.

RELIABILITY OF TESTS AS COMPARED WITH TEACHERS' GRADES FOR THE MONTH IN INDICATING ACCURATELY THE MERIT OF THE INDIVIDUAL PUPIL'S WORK IN ARITHMETIC

A single performance of an individual along any line commonly is not a true indication of his ability in this particular. In order to ascertain how accurately these tests indicated the rank of a pupil in his class the total scores for all tests and from Sets I to O were compiled for the pupils of one school in one of the city systems. The teachers were then requested to furnish the grades of these pupils for the month during which the tests were given. The Pearson method adapted to rank differences was used in determining the correlations. The results were as follows:

Monthly Grade in Arithmetic with Total Score from Tests I to O	
Grade 8	0.55
" 7	0.64
" 6	0.58
" 5	0.47

When the total scores from all the tests (A to O) were used in computing the correlation, coefficients were found to be somewhat less than the foregoing, with a single exception.

The correlation was shown in another way. Pupils were grouped, first, upon the basis of the teacher's monthly grade in arithmetic: pupils ranking between 91 per cent and 95 per cent were called Group I, those ranking between 86 per cent and 90 per cent were called Group II, etc. They were then grouped upon the basis of their total scores in Tests I to O inclusive: those ranking between 43 and 48 points were included in Group I, those ranking between 37 and 42 points constituted Group II, etc. Table VIII shows the relations of these groups. It should be read as follows: In Grade 8, 25.9 per cent of those who ranked in Groups I, II, III, etc., according to their teacher's marks also ranked in Groups I,

II, III, etc., upon the basis of points made in Tests I to O inclusive; 37.1 per cent of those who ranked in Groups I, II, III, etc., in the first series ranked in Groups II, III, IV, etc., or vice versa; there was a difference of one step in the two ratings.

TABLE VIII

GRADE 8

25.9	per cent of the two rankings agreed							
37.1	"	"	"	"	were	1	step	apart
22.6	"	"	"	"	"	2	steps	"
11.1	"	"	"	"	"	3	"	"
3.3	"	"	"	"	"	4	"	"

GRADE 7

21.4	per cent of the two rankings agreed							
51.8	"	"	"	"	were	1	step	apart
17.9	"	"	"	"	"	2	steps	"
5.4	"	"	"	"	"	3	"	"
3.5	"	"	"	"	"	4	"	"

CONCLUSIONS

1. The score attained by the two groups of schools is less satisfactory than that of the Cleveland schools. The rural schools in 35 out of 60 instances have done this formal work slightly more satisfactorily than the city and village schools taken as a group, although there are individual schools in the latter group that excel the rural-school median in many instances.

2. While the rate of progress from grade to grade as indicated by the total scores in Table I is quite consistent, this is not the case when individual school systems are considered. In fact, in case of the latter this is both uncertain and unsatisfactory. Either the course of study, poor teaching, or the weakness of a certain grade may account for this difficulty.

3. Courses of study should make definite provision for the reviewing of essentials from grade to grade. This should not be left to the discretion of the teacher.

4. Supervisors of teaching must see to it that drills are provided in each grade which will reach *all* the children. The large number of children making a very low score would indicate that present methods of procedure are not reaching them.

THE COMPARATIVE ACCURACY OF THE AYRES HANDWRITING SCALE, GETTYSBURG EDITION

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PROBLEM

This is a report of an experiment devised to measure the comparative accuracy of the revised Ayres Handwriting Scale, called the Gettysburg edition, and the three-slant edition published by the same author. It is assumed that the principal justification of the new scale would be its greater accuracy, when compared with the older one, as a measuring instrument.

METHOD

The experiment included two series of tests. The first series was conducted as laboratory work in connection with a university course in educational measurements. Six advanced students without previous experience in the use of handwriting scales and without knowledge of the problem each scored 300 samples of handwriting by both the scales mentioned. They were directed to score all papers by both scales as accurately as they could without instruction during the progress of the work and without consulting the scores of others or their own previous scores by a different scale. Discussion of problem and results was deferred until after the scoring was completed.

The six scorers were randomly divided into two groups of three each. The samples of handwriting consisted of three lots of 100 samples each, arranged in sets of 25. The samples were scored in their numerical order from 1 to 300. In order to equalize the effects of practice, Group I began the scoring with the three-slant edition, Group II with the Gettysburg edition. After scoring 25 samples by one scale, each scorer was required to score the same 25 samples by the other scale.

[1] The writer is indebted to Principal E. F. Down, of Highland Park, Michigan, for valuable assistance in this study.

In the hope that some light might be thrown on the relation between the accuracy of the scales and the similarity of content in scale and copy material, samples with three different copies were used: Samples 1 to 100 contained material selected from the three-slant edition; samples 101 to 200, the copy of the Gettysburg edition; samples 201 to 300, "Mary had a little lamb." All the writing was done by pupils in the upper elementary grades.

TABLE I

FORM OF TABULATION

Three-slant Scale, Three-slant Copy, Group II

Sa	SCORES						Aver-age	DEVIATIONS						Average Deviation
	BT	WL	JM	ED	MG	ECD		BT	WL	JM	ED	MG	ECD	
1...	80	40	40	40	50	40	48.33	31.66	8.33	8.33	8.33	1.66	8.33	11.11
2...	60	40	40	40	30	60	45.00	15.00	5.00	5.00	5.00	15.00	15.00	10.00
3...	20	30	30	20	20	20	23.33	3.33	6.66	6.66	3.33	3.33	3.33	4.44

The copy for samples 1 to 100 was as follows:

THREE-SLANT COPY

Ichabod prided himself upon his dancing as much as upon his vocal powers. Not a limb, not a fibre about hero the himself vegetation families same the upon eye his of scenes inhabitants of the valley and fiction becoming awe inspired that Ichabod jogged away at the stranger's appearance surprised not been home we had of country cheer guests the of bashful square built passed by with flourish Daughters there with romped his by called city and rider forwards pears and peaches and beef smoked by tune psalm of the pedagogue affrighted hair in devil lurking puny mere your country cheer good at the flourish but no traces of upon eye enterprise same the do to gesture his best country the in into spirit own his of so left more little was there had estate his through that The appearance of Rip ever with delight passed by the find still not should labor profitable kinds it should parlor painting the and felt proud judge may we if day him in rusty fowling piece.

The scores and deviations were tabulated in the form shown in Table I. The mean average deviation of the scores was used as an index of accuracy. This value, found by averaging the values in the final column of the table, was calculated for each scale and each group of scorers with each lot of samples, making in all twelve coefficients of error, six for each scale.

RESULTS

Table II shows the results in the first series of measurements:

TABLE II

COMPARATIVE ACCURACY OF AYRES'S HANDWRITING SCALES

Order of Scoring Samples: 1 to 300

COPY	NUMBERS OF SAMPLES	MEAN AVERAGE DEVIATION	
		Three-slant Edition	Gettysburg Edition
Three-slant.....	1–100	6.51	5.99
Gettysburg.....	101–200	6.13	5.44
Little lamb.....	201–300	5.44	4.45

An examination of the table reveals the fact that in the case of each lot of samples the mean average deviation, or error, was greater for the three-slant edition.

With both scales the amount of error decreased as scoring continued, the decrease being greater in the case of the Gettysburg edition. This decrease seemed to be due either to change of copy or to improvement with practice. In order to determine the relative effects of these two factors, as well as to verify the foregoing finding concerning the relative accuracy of the scales, a second series of measurements was conducted with six other scorers, selected, directed, and grouped like the first. In this series the same plan of scoring as in the first series was followed, except that the three lots of samples were scored in the reverse order, and in sets of 50 instead of 25. For convenience the samples were scored as listed in Table III with the same result, for present purposes, as would have been produced by an exact reversal of order. The results of this series are given in Table III.

The accuracy of the Gettysburg edition was found to be greater than that of the three-slant edition in the scoring of two of the three lots of samples in the second series of measurements.

Though the order of scoring the samples had been reversed, the error of the Gettysburg edition again decreased as practice with the scale increased, indicating that the progressive decrease in error was a practice effect rather than an effect of difference in copy.

In Table IV is given the average amount of error for the two scorings of each of the three copies by each of the two scales. The three kinds of copy—one similar in content to the material of the three-slant scale, another identical with the material of the Gettysburg scale, and the third bearing no special resemblance to either—were selected, as previously stated, with a view of determining

TABLE III

COMPARATIVE ACCURACY OF AYERS'S HANDWRITING SCALES

Order of Scoring Samples Reversed

COPY	NUMBERS OF SAMPLES	MEAN AVERAGE DEVIATION	
		Three-slant Edition	Gettysburg Edition
Little lamb.....	201–300	7.02	7.59
Gettysburg.....	101–200	8.28	6.19
Three-slant.....	1–100	7.93	5.93

TABLE IV

COMPARATIVE ACCURACY OF AYRES'S HANDWRITING SCALES

Summary of Average Errors

COPY	NUMBERS OF SAMPLES	AVERAGE ERROR			
		Three-slant Edition		Gettysburg Edition	
Three-slant....	1–100	6.51		5.99	
		7.93		5.93	
Average.....	.....		7.22		5.96
Gettysburg....	101–200	6.13		5.44	
		8.28		6.19	
Average.....	.....		7.21		5.82
Little lamb....	201–300	5.44		4.45	
		7.02		7.59	
Average.....	.....		6.23		6.02
Average.....	.....		6.89		5.93

whether or not the accuracy of these handwriting scales increased with the increase in content resemblance between scale and copy material. In Table IV it will be observed that when identical content was scored by the Gettysburg edition the average error was 5.82; when different content was scored the average error in one case was 5.96, in the other 6.02. When similar content was

scored by the three-slant edition the average error was 7.22; when different content, 7.21 and 6.23. That is, when the Gettysburg edition was used on copy of identical content its average coefficient of error was lowest. When the three-slant edition was used on copy of similar content its coefficient of error was highest. However, in interpreting these results, consideration must be given to the fact that the similarity between scale and copy content mentioned in connection with the three-slant edition was slight. In spite of the fact that this copy was composed of material selected from various parts of the three-slant scale, the amount of content resemblance between the copy and a large majority of the samples on the scale was small or negligible. There is some evidence, therefore, that the accuracy of the Gettysburg edition is greater when scale and copy content are the same. Additional experimentation will be necessary to establish the fact and amount of this increase. The point involved is an important one in the construction of scales. Theoretically, it seems, the accuracy of a scale, built on the principle of the ones with which we are dealing, should increase as similarity increases between the content of the scale and that of the educational product to be measured. The problem arises every time one attempts to measure a description of a street by a description of Venus de Melos, or the drawing of a man by drawings of houses and trees.

The combined average errors presented in Table IV indicate in slightly different form the superior accuracy of the Gettysburg edition in scoring each of the three lots of samples. The average errors were 7.22 as opposed to 5.96 for the first hundred samples; 7.21 as opposed to 5.82 for the second hundred samples; and 6.23 as against 6.02 for the third hundred, the larger error being in each case charged to the three-slant edition. The results on the relative accuracy of the two scales may be summarized in the figures for total average error given in Table IV: three-slant edition, 6.89; Gettysburg edition, 5.93.

CONCLUSIONS

1. In two series of tests the Gettysburg edition of the Ayres Handwriting Scale was found to be more accurate as a measuring

instrument than the three-slant edition. The average error of the former was 5.93; of the latter, 6.89.

2. The error of measurement decreased as practice, without instruction, increased.

3. The accuracy of the Gettysburg edition seemed to increase as the similarity increased between scale and copy content.

4. There is need of determining quantitatively the relation between accuracy of measurement and similarity in scale and measured content.

EDUCATIONAL WRITINGS

I. CURRENT TENDENCIES IN THE CONSTRUCTION OF SPELLING-BOOKS FOR ELEMENTARY SCHOOLS

In no subject of study has the use of quantitative methods in education been more practically worked out and more pertinently related to the design of courses of study and to the teaching of children than in spelling. One outstanding characteristic of the design of new courses of study has been a demand that the materials of the course be designed with careful reference to actual life-needs of children. In spelling, this is interpreted to mean that the words which children will learn to spell shall be the words which they use spontaneously in writing in their daily lives, both as children and as adults. The design of such courses of study clearly will not confuse the issue as to which vocabulary shall determine spelling content, as has the construction of spelling-books in the past. New tendencies in the construction of spelling-books show that the authors are taking advantage of the scientific movement to improve at least five outstanding deficiencies of American spellers. Let us sketch briefly the development of these books in order to be able to point out clearly the new tendencies in the design of courses in spelling.

I. THE EARLY AMERICAN SPELLERS

Spelling-books prior to 1880 revealed five distinct characteristics:

1. They were extremely long. It was relatively common, for example, to find 12,000 to 15,000 words making up the content of spelling-books. This is well illustrated, for example, by the old "Webster," by McElligott's compendious book, and even by Harrington's textbook, issued as late as 1884. A voluminous content, then, was an outstanding characteristic of these books, and hence the teaching of ten to fifteen thousand words was characteristic of early instruction in spelling.

2. Spelling-books were regarded as writing- and language-books, at least incidentally. Spelling did not until very late come into its own as a separate subject of study in the elementary curriculum with an independent allotment of time. That each of these books was a writing- and-language-book is evidenced, for example, by the titles and prefaces, which show that they aimed deliberately to teach orthography and pronunciation. They give, for example, a detailed analysis of the sound in the English language; they give keys to pronunciation. The initial lessons consist of syllables which bring out the pronunciation of the different vowels with appropriate diacritical markings. The McElligott claims that "it requires each exercise to be written and thus

engages the eye as well as the ear in the study of orthography while at the same time it serves to improve the pupil in penmanship." It makes elaborate use of systematic etymology—classifies kinds of words, develops the use of prefixes and suffixes, the rules for forming derivative words, etc.

3. *These books were poorly graded.* Instead of being developed from the concrete experience of the child as he matured through the different grades they were graded in accordance with word length, often the number of syllables in a word being the governing principle. Spelling was evidently taught in close connection with an oral grasp of words. Syllabication controlled the psychology of the teaching of spelling according to our early masters. Lessons began with long, difficult words like "stigmatize," "criticize," "cleanse," and were taught in the introduction of the work so as to illustrate the use of different suffixes, *ize, ise, fy,* etc. As the material proceeded the exercises were analytical in their development.

4. The content of the spellers was obviously *not designed from a consideration of the child's later life-needs.* Careful scanning of these books revealed the inclusion of many thousand words which, as we now know from objective studies, will never come into the writing vocabulary of the average adult. Our first characteristic—extreme length—confirms this point that we are now making with regard to the utility of the content.

5. The spelling-books were *not constructed with regard to a sound consideration of the psychology* of teaching the association of meanings and symbols.

II. CHANGES IN THE CHARACTER OF SPELLERS FROM 1880–1900

With the eighties came certain general changes in the construction of the spelling-book, and thereby of the spelling course of study. The course at this time may be typified by Harrington's *Graded Spelling-Book* (1884). The preface comments on the fact that the old-style spelling-books are in disrepute. The author recognized that we should not drill pupils, first, on words of whose meaning they have no idea, and, secondly, on a large number of words which they will not use. He says, "This graded spelling-book claims attention because it is constructed on a rational basis and takes account of the natural laws of intellectual progress and is constructed so as to be attractive to the learner." The spelling-books now revealed certain tendencies to concentrate on fewer words, Harrington having 8,000 in his book. (It is true, however, that in the past five years several spelling-books have been issued which contain more than 10,000 words each!) Spelling was still regarded even by Harrington as aiming to contribute to the teaching of language. He recommends, for example, that the book be used as a guide to the correct command of language, the development of a vocabulary that will enable the pupil to read intelligently the newspaper, the magazine, and the best of our current literature. We see here an emphasis upon *reading vocabularies,* from which we are most decidedly moving away at the present time, *emphasizing only*

the writing vocabulary of the child and the adult in the construction of our spelling course of study. (Thus far no studies have been made of *speaking vocabulary*, although it seems clear that our *foundation vocabulary* must eventually be completed by careful accounting of it.)

In connection with the third characteristic of the early spellers mentioned above we see a decided improvement, but still one worked on a purely introspective and subjective basis. Harrington and others working in this decade recognize that the content of spelling must not only be more condensed but must be *graded* to fit the stage of development of the child. *Words*, for example, *are selected* not according to the number of syllables but *according to the order in which words may be learned and used* as a child advances in knowledge. Every word which is to be presented shall be given an intelligible connection with other words so as to lead to a clear grasp of meaning. It cannot be said, regarding the fourth characteristic, that the content of spelling-books even in the eighties and nineties was designed any more from consideration of the child's later adult needs than were the books prior to those days. However, there was an introspective attempt on the part of the authors of these texts to eliminate the dead wood from the spelling curriculum. It was not established upon careful quantitative investigation of the actual needs of human beings. The fact should be emphasized at this point that we are interested primarily in *methods of developing a relatively permanent course of study.* It should be clear that a relatively permanent course of study can come only when objective quantitative methods of investigation supplant the previous subjective or introspective methods upon which our earlier courses were founded. Fifthly, the spelling-books typified by Harrington attempted to "psychologize" the instruction of spelling. On the whole it must be said that this was founded not upon an objective investigation but upon a purely introspective analysis.

A step in advance was marked by the publication of Rice's *Graded Spelling-Book*. This book, although established in the last analysis primarily on Mr. Rice's introspections about the learning and teaching of spelling, was stimulated originally by his pioneer work in the testing of the spelling abilities of many thousands of children during several years in the late nineties. The book is arranged, according to the author, "on a definite psychological plan." It is based on an examination of the work of the schools in nearly all the large cities of the country and upon the actual spelling of more than 33,000 children. Its characteristic features are:

1. Grading of the words in accordance with the natural growth of the child's comprehension.
2. The precedence given to common words.
3. The small number of words as compared with the ground covered.
4. The provision made for thorough drill in connection with common use and review.

It will be noticed that the claims of the author of this speller accord quite interestingly with the characteristic deficiencies of the early spelling-books. It should be noted, however, that this book, which contains about 5,000 words, was built by the author on a purely subjective basis. The difficulties of the words were determined by his introspection. If we may judge by the success with which he designed the spelling-test in 1895, which he gave to 33,000 children, we may infer that the grading of the words is open to severe criticism. We are interested here, however, to note the changes in the attitudes of those who were constructing our courses of study in spelling.

In 1912 still further advance was marked by the Pierce spellers. These contained about 4,000 words and were noted for the recognition of the need for the careful grading of words, for the omission of a large number of words which do not belong in spelling-books, and as an attempt to psychologize soundly the teaching of spelling in the public schools.

III. ELEMENTARY-SCHOOL SPELLERS PUBLISHED IN 1915–17

The enumeration of the deficiencies of early American spellers points to the most important characteristics of the new spellers. School administrators in selecting textbooks in spelling certainly should evaluate the texts on the following bases: Are they short? Are they confined to foundational words which are important in present or later use in writing? In this connection are they based upon scientific investigation? (Many investigations have been reported along this line. It seems clear that to be most serviceable the results ought to be put into the course of study in the form of textbooks.) Are the books well graded? Are they organized in terms of short lessons, and do they take definite account of the mental growth of children? Are they constructed upon a careful consideration of the psychology of learning to spell? To what extent do the different books make use of the important beginnings that have been made in the analysis of spelling abilities and in the experimental teaching of spelling?

Four sets of spellers have appeared in the past two years, namely, the *Aldine Speller*,[1] the *New Barnes Speller*,[2] the *Every Day Speller*,[3] and the *Modern Speller*.[4] Each of these exhibits clearly the tendency toward abbreviation in content—the *Every Day Speller* best of all, with the *Aldine* next. These two series are unique in that they have made careful use of the quantitative investigations of Ayres, Jones, Cook, O'Shea, and others. During the past four years these investigators have established clearly the fact that our

[1] By Catherine T. Bryce and F. J. Sherman. New York: Newson & Co., 1916.

[2] By Edward Mandel. New York: A. S. Barnes Co., 1915.

[3] By M. V. O'Shea, W. A. Cook, and Florence Holbrook. Indianapolis: Bobbs-Merrill Co., 1917.

[4] By Kate Van Wagenen. New York: Macmillan Co., 1916.

minimum spelling content is not more than 3,500 to 4,000 words, and perhaps might be as low as 2,000. They have also made a distinct beginning in the standardization of words as to spelling difficulty. Ayres's "Scale for Measuring Spelling Ability," for example, does this for the one thousand commonest words, as shown by the spelling of elementary-school children in 84 cities. The *Every Day Speller* and the *Aldine Speller* have checked their words in this regard as well as for accuracy of content. The *Every Day* probably has made use of the soundest procedure in this connection, because it is based on years of careful investigational work done by Professors Cook and O'Shea. The other two series claim to have graded their words carefully for difficulty, but this has been based only on the usual classroom analysis of teachers. The experimental work of the present writer during the past four years leaves no room for doubt that this method of designing textbooks will not lead to books of permanent adoption. The most permanent design is going to come from carefully controlled classroom observation of teaching by teachers and specialists working in conjunction, by thorough stenographic records of procedure, methods, achievements, and difficulties of pupils. *No speller has been designed yet through such detailed experimental work.* It is doubtless true, however, that the work done by Cook and O'Shea will lead to the most helpful contribution in the way of a speller that we have had yet.

From the standpoint of the degree to which books are organized on a basis of thoroughgoing psychology of spelling there are distinct differences. The *Barnes Speller* claims as its chief point of distinction that its

> words are graded according to difficulty, but that the basis of compilation is *topical* and *not formal*. That is, the words are grouped into lessons, not because of orthographic difficulties, but because they are related in thought and are usually associated in context. We are not interested in learning to use or spell words simply because they are difficult or easy, phonic or non-phonic, but because they are symbols of ideas associated with our environment, and as such we must ultimately employ them.
>
> Words grouped *logically*, thus:
>
> | | | | |
> |---|---|---|---|
> | bedding | *bedstead* | bedcover | pillow |
> | pillowcase | tick | sheet | blanket |
>
> are all related to bedstead, and hence they form an interesting, homogeneous group.
>
> Words grouped *formally*, thus:
>
> | | | | |
> |---|---|---|---|
> | league | *bedstead* | axle | apology |
> | thither | audience | athletic | eightieth |
>
> *are unrelated to bedstead*, and hence they form an uninteresting, heterogeneous group of orthographic difficulties. Yet this is a typical lesson from one of a great number of spelling-books in which the basis of grouping is orthographic. [This criticism of other spellers in making use of the term "orthographic" must be said to miss the real point.]

A careful study of the learning process in spelling will raise in the mind of the reader grave doubts concerning the validity of this topical principle of

organization of words. If the instruction in question were aimed at enlarging the vocabulary of children in the most systematic fashion and not at developing skill in associating the sound of words with the specific order of letters in the words, then this topical principle would be valuable indeed. It seems clear, however, that as a principle for the sound grading of words in spelling we should be insisting upon one which will make use of gradation of words in order of difficulty. It should be noted, however, that the *Barnes Speller* still clings to the long-lesson method of presenting words, eight to sixteen being commonly found in each lesson. The *Modern Speller*, on the other hand, builds up its lessons on the principle of two to four new words a day, giving sentences in which each word is used. The typography is so arranged that the new words are made to stand out. In the *Aldine Speller*, although its lessons are relatively long, eight to twelve words being most common, the outstanding difficulties of words are pointed out very cleverly. For example, in Lesson 1, Book II, the word *world* appears in the list, and then the sentence, "When you spell *world* make the *o* very clear." The newer textbooks in spelling are recognizing the importance of making the outstanding difficult places in words clear to the student. The investigations that have been made by Jones and others in recent years have shown that in spelling, as well as in geography, arithmetic, algebra, etc., *the important mistakes that children make are found to be relatively few and that they recur many times in pupils' work*. For example, Jones points out a list of one hundred spelling demons, the commonest misspelled words. The *Aldine Speller* makes use of this list, printing it in two parts as definite review tasks for the pupil to master at the end of the third and fourth grades. Furthermore, Cook and O'Shea have taken advantage of the facts that are being revealed concerning the difficulties of words by making use of distinctive differences in typography. For example, the first *a* in "separate" would be made to stand out by being printed in bold-face type, thus calling to the attention of the pupil the outstanding difficulty in the word.

Thus this review of the recent developments in the construction of spelling-books shows that our courses of study will doubtless in the future be more and more designed with reference to the scientific determination of the needs of students of the stages of mental development and specific mental processes involved in the learning of these various kinds of subject-matter by children.

II. COMMENT ON CURRENT EDUCATIONAL WRITINGS

1. *Doubt cast upon the value of the present teaching of "real" problems in arithmetic.*—The weight of educational opinion is in favor of the teaching of *business practice* in elementary-school arithmetic. It clearly is of great importance to know whether the recent developments in the emphasis upon so-called

real or practical problems in arithmetic actually function in the life of the pupil. Mr. Davis' new study offers definite information upon that point.[1]

The investigation aims to determine what knowledge pupils in the eighth grade have of business terms which they meet in arithmetic. It was an outgrowth of the writer's experience in the teaching of evening classes in English in a commercial high school. This experience pointed out the definite need of ascertaining whether the practical problems in arithmetic were taught as really to eventuate in effective skill on the part of the student. Reference to a quantitative study made by Jessup in 1913 for all cities of 4,000 inhabitants and over in the United States showed clearly that there was a distinct emphasis being laid upon the "practical" problem in elementary-school arithmetic. A careful examination of the arithmetic textbooks which are currently used confirmed this statement.

To check up the outcomes of teaching, Mr. Davis prepared a list of twenty-two questions, examples of which follow: "What is a life insurance policy about?" "How is a check used?" "What is the difference between signing and endorsing a check?" "Explain as fully as you can the meaning of railroad stock." "What is a post-office money order?" "Show how a promissory note may be used in business." "What is a mortgage?" "What kinds of taxes can you name?" "What does an assessor do?" These questions were sent to a number of large and small cities. A number of quotations are offered in the report from the answers which were obtained from eighth-grade pupils. Thirty sets of the answers representing 1,541 papers and 30,626 answers were tabulated. The report gives the detailed tables of results. The striking facts deduced from the tables may be summarized as follows:

1. About one-third of all the answers were correct.
2. Only two schools had more than 50 per cent of their answers correct.
3. Eleven schools had less than one-third of their answers correct.
4. The average school had about 36 per cent of the answers correct.
5. Four questions had more than 50 per cent of their answers correct and four other questions had less than 25 per cent of their answers correct.
6. By considering first and second rank by schools for any one question, 16 out of 30 schools rank first or second highest on some one question.

In the light of the preceding recapitulation, one general conclusion is evident: "Business practice (as indicated by the questions) is, as a rule, not well known to pupils of the eighth grade, although it is possible for them to know it." Another conclusion outstanding in this study is, "Pupils when dealing with arithmetical questions involving business practice are engaged in abstract arithmetic only."

[1] *Business Practice in Elementary Schools.* By Roy Davis. Harvard Bulletins in Education, Vol. VI, October, 1917. Cambridge, Mass.: Harvard University Press. Pp. vii+32.

In considering recommendations to be made as the result of this investigation Mr. Davis comments interestingly on the three fundamental reasons that are advanced for the teaching of business arithmetic. First, that the subject gives the child added interest in arithmetic. His comments are to the point that this is a very doubtful basis. Secondly, the likelihood that the pupil will be able to do the special arithmetical problems of his job later in life seems, according to Mr. Davis' analysis, to be even more doubtful. On the other hand, he says that the third reason, namely, giving the pupil some acquaintance with the big facts of commercial life, appears to be entirely sound. His comments are all summarized in the suggestion that "what seems to be needed is a textbook on business practice which will contain the minimum that the teacher ought to know in teachable form." Apropos of this he makes definite suggestions as to what such a book ought to contain. This investigation ought to be a powerful stimulus to the overhauling on quantitative grounds of the "real" or "practical" problem material in elementary-school arithmetic.

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2. *A helpful handbook on the education of defectives in the public schools.*—Since the time that we have recognized clearly the presence of a considerable number of mentally defective children in the grades of the public schools the methods of instruction of those in charge have been built on *three rapidly changing hypotheses*, each one followed for a time and soon discarded in favor of the next: First, that "defectives" were qualitatively like "normal" children. That therefore they were "slow" only—that they needed the same course of study, but must be given more time to master it. Secondly, this theory being shown an error, the experts discarded it in favor of a combination half-time plan—both academic and manual training being regarded as essential. The apparent success of the second plan has not in all cases even yet been adequately evaluated by the workers in that field. Many have failed to see that the success obtained was due to the emphasis upon the manual instruction and not upon abstract academic material. Thirdly, recently those of greatest insight have seen that

> these children lack the power of abstract thought. They cannot deal with abstractions, hence they can never develop moral principles as such. This sounds hopeless and would be hopeless were it not for one thing. Fortunately there is one power that comes in to save the day—the power of habit. These children if trained in fixed habits—habits of conduct, habits of health and hygiene, habits of activity and work—become happy, harmless, and even helpful persons. How shall these habits be fixed upon them?

Among these most intelligent workers is Miss Meta L. Anderson, who has recently published a most helpful manual for teachers of defectives in the public schools.[1] This book is built upon the clear recognition that defective

[1] *Education of Defectives in the Public Schools.* By Meta L. Anderson. Yonkers-on-Hudson, N.Y.: World Book Co., 1917. Pp. xvii+104.

children cannot be trained in the intelligent use of academic material such as reading, writing, arithmetic, spelling, geography, etc., but that their curriculum needs are found in industrial and manual training.

There is little doubt that this manual will contribute in a very specific way to the successful teaching of defective children in the public schools. It is on the whole a very sensible presentation, based upon scientifically determined facts concerning subnormal children. The author not only based her work upon sound principles, but puts into the hand of the teacher specific suggestions for detailed procedure. For example, she shows that in order to select children while the use of mental tests is ideal, by using age-grade facts on retardation and supplementing these by the judgment of teachers, one can evolve a compromise plan that will actually work in a helpful way in a school system. She shows clearly, for example, the greater efficiency of the *special school* over the *special class*. She gives a clear and tabularly arranged analysis of what the various levels of mentality can do, and what specific instruction can be given them successfully. She gives detailed directions, told in interesting style, for each phase of the instruction, breaking up the general problem into three levels: First, kindergarten; second, the departmental division of special schools; and third, the highest or trade classes. Her principles and directions are illustrated in detail by interesting concrete "cases." The curriculum is outlined in great minutiae for each of these three levels of instruction. We have no hesitancy in commending this book to both administrative officers in charge of city systems and teachers of defective children in the public schools.

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3. *A discussion of the organization of subject-matter in elementary-school courses.*—There are many signs evident in the changing emphasis of our educational literature that the recent developments in the analysis and organization of the subject-matter of psychology ought to be put more and more concretely in the hands of teachers. In the past few years we have seen a distinct turning toward the development of psychology of each specific subject. Professor Heckert's new monograph[1] is one of the first attempts to do this for an isolated but important problem in applied psychology. It is an attempt to make the psychology of "thinking"—of "problem solving"—function in the teacher's organization of subject-matter in planning lessons and courses of study.

His first problem is, What are the fundamental psychological processes involved in "organization"? How do people *organize* materials in order that problems may be solved? His second problem, after showing the steps involved in the solution of the first, is to show the differences in methods of

[1] *The Organization of Instruction Materials.* By J. W. Heckert. Teachers College, Columbia University, Contributions to Education No. 87. New York: 1917. Pp. v+107.

organizing data for the solution of problems in various stages of the mental development of children. In the third chapter he attempts to show the extent to which the methods of solving problems used by children agree with those of adults. He asks such questions as,

> Is organization a factor in child life? If so, how do children organize? Do children conceive problems? How do they arise? What is their nature? What is their method of solving them? What is the nature of the experiences which they resort to in solving them? In what form do they recall their experiences? What is the nature of the resulting organization?

To answer these questions he cites many specific instances of children's "problems" and modes of procedure in solving them which he has collected both in and out of school. In this discussion he shows the closeness with which the child's procedure parallels that of the adult. The conclusions of these preliminary chapters are summarized as follows:

> It is evident from the preceding discussion that organization of knowledge is the important means for the control of both old and new experiences. Organization of the facts within one's experience indicates that the relationships obtaining among them have been clearly recognized and possibly expressed; that in this manner clearness of meaning has been brought about; that the various elements in the unit of organization are seen in proper perspective; that greater simplicity is attained; that the several elements, individually and jointly, have greater force; and that conduct is likely to be more efficient because it has a rational basis. Organization must therefore be an important end in the teaching process.

The author then discusses by means of concrete examples current practice in curriculum-making, and sets up standards for judging it. He finds that present courses of study are distinctly deficient in the extent to which they aid teachers in the organization of material. He then gives ten detailed illustrations of the way in which the preceding principles should be carried out in specific organization of lesson materials from the various subjects of study.

The book is directed primarily at the elementary-school teacher. It aims to help her in the organizing of lesson material and course material by interpreting the recent expressions of the psychologist concerning how children think. It is a timely attempt, and the degree to which it will function in the teacher's work will be hampered only by the fact that the book is somewhat hard to read for the person who does not know very thoroughly the new psychological terminology. The book is very well supplied indeed with concrete illustration material.

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4. *A suggested set of record forms for vocational schools.*—With the rapid development of vocational education in the past decade teachers of these new subjects have been constantly more and more burdened by "paper work"

—record-keeping, etc., which has been entailed by the organization and handling of materials, by the marketing of manufactured products, etc. The latter problem is becoming an especially important one. In taking industrial processes into the school for purposes of instruction teachers have thus been forced in the early days of organizing this program to divide their attention between teaching and routine bookkeeping. They have been relatively untrained for either, being largely so-called "practical" men who had the trade but not the pedagogy nor the commercial-accounting skill needed. In the main the teacher of industrial subjects has had little time to devote to the designing of record forms to facilitate the carrying on of the routine aspect of his work. He should welcome, therefore, any such systematic plan as is brought to his hand by Mr. Eaton's new compilation.[1] This monograph is a compilation of record forms built into a unit set for vocational schools. It contains eight distinctly different types of forms:

I. Pupils' Record Forms, both permanent and temporary
II. Instructors' Records
III. Supplies and Maintenance Records
IV. Shop Production Records
V. Buildings and Ground Records
VI. Power Plant Records
VII. Cost and Production Record
VIII. Forms for Reports required of the school

Many of these forms cover those included in the "general" educational accounting for a city system. Our contact with the type of work that is being done by progressive school accountants, superintendents of supplies and buildings, etc., leads us to conclude that our progressive city systems are probably already installing systems of accounting for materials and for pupil and teacher activities in a way that will exceed in comprehensiveness these forms of Mr. Eaton's.

The chief value of this set of forms lies in the fact that it presents a systematic scheme for vocational schools. Mr. Eaton has constructed a set of record forms for each phase of the situation that the director or instructor in vocational education will have to meet as he goes into his new task. Hence, in spite of the fact that other departments of the city system may be working out more effective schemes for detail accounting for certain portions of its activities which are covered by Mr. Eaton's report, yet these will certainly be helpful from the standpoint of the installation of a new type of instruction in the city schools. In this report details have been simplified and classified. Little time and labor should be required to manipulate them, and the operations of the school will be so tabulated as to set forth accurately actual operating conditions.

[1] *Record Forms for Vocational Schools.* By Joseph J. Eaton. School Efficiency Monographs. Yonkers-on-Hudson, N.Y.: World Book Co., 1917. Pp. vii+56.

5. *A book on new movements in religious education.*—During the past few years the pioneers in religious education have been waking up to the new technique that the scientific educationists have developed for the solution of their problems. A few men have seen clearly that the problem of moral and religious education in this country will be solved adequately and relatively permanently only by an intelligent use of scientific procedure. No better exposition of this can be found than in Athearn's latest book.[1] In this book, which is both a clear statement of fundamental principles of religious education and an excellent handbook of "what to do and how to do it," the author raises a vast number of problems which are pertinent to the school teaching of religious questions. The author is interested more in a sane intelligent survey of the present situation than in following "blind faith" in the future.

This book will show the religious educator what remarkable developments have taken place in the intellectual education of children in our time, and will show these as interpreted by a religious educator. It will show the school administrator and the student of education on the other hand that the leaders in religious education are not only ready and willing to make use of the technique of the scientific educationist, but are already doing it. To illustrate the degree to which church and state are correlating their endeavors he sums up in chapter ii what each of the various educational agencies is doing in this particular. He shows to what extent religion is taught in the public schools, in the parochial schools, and discusses the tendencies in religious education through co-operation with the public schools—the extent, for example, to which "church" education-vacation schools have been established, and the degree to which academic credit is offered for religious instruction by churches in colleges, high schools, and elementary schools.

The broad point of view that is taken toward the correlation of church and state in education is shown by such statements as these:

> But the parochial-school system involves deeper questions than the teaching of religion in the public schools. The very essence of democracy is involved. The schools of a democracy must teach self-reliance, initiative, and originality as well as obedience, docility, and conformity. They must furnish their pupils with facts and teach them scientific methods of interpreting and evaluating facts and detecting fallacies. The schools of a democracy will indoctrinate their students with the scientific method and with the ideal of truth and of true democracy. In other words, the schools of a democracy will make democrats, and a non-democratic religion, or a religion with a non-democratic church policy, will fare badly among a people surcharged with the ideals of democracy. Every non-democratic church organization is sure to feel and chafe under the effects of the democratization of the people by the schools of a democracy. It is increasingly apparent that a democratic nation involves a democratic religion.

[1] *Religious Education and American Democracy.* By W. S. Athearn. Boston: Pilgrim Press, 1917. Pp. xi+394.

It seems fair to say that *when we remove from the schools of a democracy those things to which the churches object we must sooner or later remove from the churches in a democracy those things to which democracy objects*—else there can be no real democracy.

What I am trying to make clear is that the real point at issue in the parochial-school problem is, not *religion* in the public schools, but *democracy* in the public schools. Let us therefore frankly remove religion fron the public schools and let the parochial-school problem be discussed on the basis of the real issue involved.

Next, showing that we have outgrown our present facilities for the education of the *whole* child, he outlines a "community system of religious education" which shall parallel our intellectual education. Professional education in scientific method and organizing ability is shown to be the desideratum of the new community leaders in religious education.

The new attitude toward denominational control of such activities is expressed in the following striking way:

I am convinced that community work in the field of religious education cannot be done with denominational machinery. Community programs must grow out of a community's needs. *The presence of a denominational consciousness will always dispel a community consciousness, and without a community consciousness no community problem can be solved.* . . . .

The religious educator demands absolute academic freedom and he has little confidence in any type of organization which permits either commercial or ecclesiastical control. . . . . While it should be free from institutional, ecclesiastical, or commercial control, *a community system of religious education must be dominated and controlled by men and women of the most profound religious experience.*

To illustrate how to carry out a community system, he tells exactly how Malden, Massachusetts, has done it, giving the detailed organization and procedure.

The remainder of the book is devoted to three problems: first, the unification of our present agencies which can contribute to religious education; second, the present status and tendencies in the college field in religious education; finally, a discussion of the types of graduate work that can be done in the university.

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6. *Another book on the general principles of education.*—In spite of the current acceptance of the doctrine that teaching must start with the experience of the student, that subject-matter must be concrete, etc., books on the abstract "principles of education" still continue to be published for the use of prospective teachers. In the last fifteen years we have had a dozen or more of such books, based pretty largely on the newer developments in the field of applied biology and applied psychology, and expressing a thoroughgoing functional as contrasted with a structural point of view in psychology and education. Mr. Miller's new book[1] is the most recent addition to a list of

[1] *Education for the Needs of Life.* For use in elementary classes in normal schools and colleges and in institutes and reading circles. By I. E. Miller. New York: Macmillan, 1917. Pp. vii+353.

books represented by those of Bagley, Bolton, Charters, Hanus, Henderson, Horne, O'Shea, Swift, and others. Although intended for young men and women in our normal schools and colleges who have not taught, or for those of relatively little training in public-school teaching, the book starts with the thoroughly abstract problem of the "biological point of view" in determining a system of thought concerning the education of children. Education, we are told, is to be regarded "as an integral phase of the life-process"—a very well-expressed statement, but one which, to be thoroughly grasped, requires not one but several college courses in education, biology, psychology, and sociology. For the person who is fairly well acquainted with the newer developments in psychology this book is very interestingly written and a comprehensive interpretation of the new point of view and new technique which we are using in the public education of children. For the group for which it is designed, however, namely, the immature person of no teaching experience and no reading contact with problems concerning the learning of children, the book, it must be confessed, is merely a reiteration of another man's "system" of the fundamental principles of education as already set forth by the authors enumerated above. To this group at least it is extremely abstract, and we question seriously the extent to which the principle enunciated will be usable specifically in the elementary or high-school teaching of young people.

The book includes in its survey the whole field of education, namely, its meaning and aims, a survey of the child and the curriculum, and principles of teaching method which come out of an agreement upon the preceding fundamentals. The trained reader in the theory of education will get much of interest from the "logical," step-by-step way in which the author has constructed a system of thinking about the education of children. The work represents primarily a *system of thinking*, and as such might be helpful to *advanced classes* which had already had considerable contact with concrete teaching work.

The book has been written evidently with a clear recognition of the newer scientific developments in measuring instruction and in improving its technique. An elementary book, however, obviously should put into the hands of prospective teachers many of the newer and simpler tools which have come from the scientific movement—use of tests, practice material, specific suggestions concerning the ways and means of analyzing conditions within classes are needed by these young teachers with no perspective rather than this systematic, logically classified statement of fundamental principles. Thus we feel that the book will not appeal primarily to the prospective teacher or to the one whose contact with educational literature has been limited.

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7. *A brief historical review of recent educational developments.*—The publishing house of Ginn & Co., having been in existence for fifty years, desired to memorialize in some way the development of its enterprise. To do this

it has published a brief sketch of the progress of education in the United States from 1867–1917.[1] Dr. E. C. Moore was asked to write that sketch. It is a very brief description, which points out in a rather unorganized way the changes that have come about in the methods of establishing, organizing, and administering schools during the past fifty years. The quantitative references have in the main been taken from the annual reports of the Commissioner of Education. This to Mr. Moore is the source book on the development of education in the large. It is statistical, not in a tabular way, but in such a way that changes are impressed upon the reader by references to "numbers." The changes that are pointed out have to do with the training of teachers; methods of teaching specific subjects; the introduction of new subjects into the curriculum, such as drawing, music, manual training, etc.; the development of various phases of administration; the extension of secondary education, and a brief reference to higher educational developments.

The material is organized in three chapters. The first chapter is committed to showing in general the rapidity of change, a characteristic of our conditions at the present time. Chapter ii is intended to note the more important educational movements which had been started prior to 1867. Chapter iii sketches the changes since that time. The import of chapter ii is that practically all the great movements of the present day had their source in the past half-century.

On the whole the volume is uncritical. It is an attempt to sketch, without supplying a thoroughgoing foundation, marvelous and far-reaching changes in educational practice. In order to interpret such complex movements one must have a background of details, a partial acquaintance with the problems discussed. Furthermore the material is unorganized. It is merely a brief discoursive sort of review of rather recent developments in education. Being on the whole a general discussion of our historical development, it must be said that the writer's interpretation of certain movements is decidedly questionable, at least one-sided, not rounded out. The volume on the whole ought to be of service in telling the layman of the older generation something of the development in education "since he went to school." As pointed out above, however, in order to do that adequately one ought to use a more detailed "case" method and not try to cover such a wide field in such a small space.

III. CURRENT EDUCATIONAL PUBLICATIONS RECEIVED IN DECEMBER, 1917

(Detailed discussion of some of the following books will appear later.)

A. GENERAL EDUCATIONAL THEORY AND PRACTICE

GALLOWAY, THOMAS WALTON. *The Use of Motives in Teaching Morals and Religion.* Boston: Pilgrim Press, 1917. Pp. 187. $1.25.

[1] *Fifty Years of American Education.* Boston: Ginn & Co., 1918. Pp. 96.

B. PUBLICATIONS OF UNITED STATES BUREAU OF EDUCATION

CAPEN, S. P., and STEVENS, E. B. *Report of a Survey of the University of Nevada.* Washington: Government Printing Office, 1917. Pp. 184.

JARVIS, CHESTER D. *Vocational Teachers for Secondary Schools.* Washington: Government Printing Office, 1917. Pp. 85.

MACLEAN, GEORGE EDWIN. *Studies in Higher Education in Ireland and Wales.* Washington: Government Printing Office, 1917. Pp. 118.

———. *Studies in Higher Education in England and Scotland.* Washington: Government Printing Office, 1917. Pp. 279.

Report on the Work of the Bureau of Education for the Natives of Alaska, 1915–16. Washington: Government Printing Office, 1917. Pp. 66.

SMITH, CHARLES ORCHARD. *Garden Clubs in the Schools of Englewood, New Jersey.* Washington: Government Printing Office, 1917. Pp. 44.

WEEKS, STEPHEN B. *History of Public-School Education in Delaware.* Washington: Government Printing Office, 1917. Pp. 181.

C. TEXTBOOKS FOR THE ELEMENTARY GRADES

BAILEY, CAROLYN SHERWIN. *Stories for Any Day.* Boston: Pilgrim Press, 1917. Pp. 163. $0.60.

BEMIS, KATHERINE I. *The Phonic Drill Book.* Chicago: A. Flanagan Co., 1917. Pp. 68. $0.25.

BEMIS, HOLTZ, and SMITH. *The Patriotic Reader.* Boston: Houghton Mifflin Co., 1917. Pp. 194. $0.56.

COWLES, JULIA DARROW. *The Queer Little Tailor.* Chicago: A. Flanagan Co., 1917. Pp. 32. $0.50.

Patriotic Songs. American and Foreign. Chicago: A. Flanagan Co., 1917. Pp. 32. $0.10.

SMITH, LAURA ROUNTREE. *Language Lessons from Every Land.* Chicago: A. Flanagan Co., 1917. Pp. 142. $1.25.

——— *Snubby Nose and Tippy Toes.* Chicago: A. Flanagan Co., 1917. Pp. 112.

D. TEXTBOOKS FOR THE HIGH SCHOOL

AUSTEN, JANE. *Pride and Prejudice.* Boston: Ginn & Co., 1917. Pp. 408. $0.64.

COOPER, JAMES FENIMORE. *The Spy.* Boston: Ginn & Co., 1917. Pp. 339. $0.64.

ESPINOSA, A. M. *Martinez Sierra Teatro de Ensueno.* New York: World Book Co., 1917. Pp. 108. $0.50.

GOLDSMITH, OLIVER. *She Stoops to Conquer.* Boston: Ginn & Co., 1917. Pp. 99. $0.36.

HITCHCOCK, ALFRED M. *Composition and Rhetoric.* New York: Henry Holt & Co., 1917. Pp. 575.

RENDTORFF, EMMA. *Drei Märchenspiele.* Boston: D. C. Heath & Co., 1917. Pp. 66. $0.35.

MISCELLANEOUS PUBLICATIONS

A Course of Study in Arithmetic for the First Six Grades. Los Angeles City School District, 1917. Pp. 64.

ALDERMAN, EDWIN A. *The Function and Needs of Schools of Education in Universities and Colleges.* New York: General Education Board, 1917. Pp. 31.

A Manual for High Schools. New Jersey: Department of Public Instruction, 1917. Pp. 85.

Announcement of Extension Work for War Service. Austin, Tex.: University of Texas, 1917. Pp. 8.

BASSETT, WILBUR. *Wander-Ships.* Chicago: Open Court Publishing Co., 1917.

BRYCE, VISCOUNT O. M. *The Worth of Ancient Literature to the Modern World,* New York: General Education Board, 1917. Pp. 20.

ELIOT, CHARLES W. *Latin and the A.B. Degree.* New York: General Education Board, 1917. Pp. xxi+21.

HOOPINGARNER, N. L., and WEHRWEIN, G. S. *Visual Instruction through Lantern Slides and Motion Pictures.* Austin, Tex.: University of Texas, 1917. Pp. 34.

MILLARD, COLUMBUS N. *A Parent's Job.* Boston: Pilgrim Press, 1917. Pp. 227. $1.00.

Seventeenth Annual Report of the Director of Education. Manila: Bureau of Printing, 1917.

SMITH, HENRY BRADFORD. *A Primer of Logic.* Pulaski, Va.: B. D. Smith & Bros., 1917. Pp. 48.

STOLTZFUS, AMANDA. *Beginning and Developing a Rural School.* Austin, Tex.: University of Texas, 1917. Pp. 60.

The Texas History Teacher's Bulletin. Austin, Tex.: University of Texas, 1917. Pp. 41.